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ABSTRACT

The intent of this project was to improve test and programming scores of 9th through 12th grade students enrolled in the Practical Computer Skills: Logo course in a north central Florida high school. An implementation program that demonstrated teacher-designed graphical computer language Logo programs, utilized multimedia techniques, and used modern computer technology was presented. The target group was a mixed secondary class of 22 students. This project was aimed at decreasing the failure percentage of students during the Logo section, as well as improving the test scores, programming assignments, and final course grade by stimulating interest and motivation, demonstrating and presenting detailed Logo programs, and utilizing technology. The overall objective of the course's Logo section was to expose students to a higher order of logical thinking skills such as critical thinking, problem-solving strategies, evaluation and analysis, and creativity. Nearly all of the project's objectives were met, with the target group improving dramatically in all areas. Appendices include: the Practical Computer Skills: Logo Pre/Post-Test; the Computer Programming Language Attitudinal Pre/Post-Survey; project pre/post-test results; a course report card; the Rubric Scale used for scoring the course final research paper; teacher-designed programs; handouts; and the final exam. (Contains 37 references.) (Author/AEF)

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IMPROVING SECONDARY PRACTICAL COMPUTER SKILLS: LOGO TEST SCORES THROUGH GRAPHICALLY DESIGNED COMPUTER PROGRAMS AND UTILIZATION OF MULTIMEDIA AND TECHNOLOGY

by

Douglas S. Miller

A Final Report submitted to the faculty of the Fischler Center for the Advancement of Education of Nova Southeastern University in partial fulfillment of the requirements for the degree of Educational Specialist

An abstract of this report may be placed in the University database system for reference.

May 1998

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ABSTRACT

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The intent of this implemented project was to improve Practical Computer Skills: Logo test and programming scores of ninth through twelfth grade students in a north central Florida high school. An implementation program that demonstrated teacher designed graphical computer language Logo programs, utilized multimedia techniques, and used modern computer technology was presented to successfully achieve this goal.

The target group selected by the author was a mixed secondary class of 22 students. According to information gathered from previous years, prior experience, and other county personnel, 53 percent of the students enrolled in the Practical Computer Skills course should have failed the Logo section causing a lower course average for many of the students which would lead to approximately one-third of the target group failing the course entirely. This project was aimed at decreasing the failure percentage of students, during the Logo section, as well as to improve the test scores, programming assignments, and final course grade by stimulating interest and motivation, demonstrating and presenting detailed Logo programs, and through the utilization of technology. The overall objective of the course's Logo section was to expose the student to a higher order of logical thinking skills such as critical thinking, problem-solving strategies, evaluation and analysis, and creativity which can simply be called "common sense".

Nearly all of the projects objectives were met with the target group improving dramatically in all areas. In order to determine the overall successful effectiveness of the project, different instruments were used. These instruments (Appendix A-E, p.56-66), included a general knowledge Pre/Post-Test of problem-solving strategies and Practical Computer Skills: Logo, a candid Computer Programming Language Attitudinal Pre/Post-Survey, and grade averages on the individual report cards. Tables were also created to reenforce the success of this project.

Authorship Statement

I hereby testify that this paper and the work it reports are entirely my own. When it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of others in the field and in the hope that my own work, presented here, will earn similar respect.

Douglas S. Miller
student's signature

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Practicum title Improving Secondary Practical Computer Skills: Logo Test Scores Through Graphically Designed Computer Programs and Utilization of Multimedia and Technology.

Student's name Douglas S. Miller Completion date April 24, 1998

Project site Gainesville High School, 1900 N.W. 13th Street, Gainesville, FL 32609

Mentor's name Dr. Susan Arnold *Susan Arnold*
print *signature*

Mentor's position at the site Assistant Principal Phone # (352) 955-6707

Comment on impact of the project (handwritten):

Doug Miller has inspired and excited his students each semester doing more with programming than has been done before in this semester course. The students have taken the challenge and excelled. In my visits, the students were writing, checking, correcting and re-writing computer programs. Mr Miller worked with the students individually. Once each of these programs is very well designed and debugged we have considered offering it as a very computer programming course in the future. Because of the interest, discussions by Mr. Miller's students and observations.

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Table of Contents

	Page
Title Page	i
Abstract	ii
Authorship/Document Release	iii
Project Verification	iv
Table of Contents	v
Chapters	
I. Purpose	1
II. Research and Planning Strategies	14
III. Method	27
IV. Results	39
V. Recommendations	50
Reference List	52
Appendixes	
Appendix A: Practical Computer Skills Pre/Post-Test	56
Appendix B: Attitudinal Pre/Post-Survey	59
Appendix C: Project Pre/Post-Test Result	62
Appendix D: Practical Computer Skills Report Card	64
Appendix E: Research Paper Rubric Scale	66

Appendix F: Teacher Designed Programs (Week 4) 69
Appendix G: Teacher Designed Programs (Week 5) 77
Appendix H: Teacher Designed Programs (Week 6) 85
Appendix I: Teacher Designed Programs (Week 7) 93
Appendix J: Handout - Music Notes and Durations 98
Appendix K: Teacher Designed Programs (Week 8) 100
Appendix L: Teacher Designed Programs (Week 9) 105
Appendix M: Teacher Designed Programs (Week 10) 115
Appendix N: Final Exam (50 Questions) 128

CHAPTER I

Background

The intent of this practicum was to improve Practical Computer Skills: Logo test and programming scores of ninth through twelfth grade students in a north central Florida high school. An implementation program that would demonstrate teacher designed graphical computer language Logo programs, utilize multimedia techniques, and use modern computer technology was presented to achieve this goal.

The setting of this practicum was a high school in north central Florida. The school is located in an urban community that covers 45.52 square miles with a stable population of approximately 96,700 people with an estimated population of 97,200 people by the year 2000. This urban community is a cultural center for the area, offering museums, galleries, a regional theater, a seasonal performing arts program, a chamber orchestra, and numerous and varied lectures.

Surrounded by forest and farms, this community is also a commercial center for the area. As with many Southern urban communities, this north central Florida university community is steadily growing with a total Labor Force of 114,346 and an annual average unemployment of 4.2 percent. The majority of the household incomes are derived from non-manufacturer employers such as the university with

11,404 employees, the university hospital with 4,007 employees, and the county school board with 3,931 employees. The second major source of income is derived from private manufacturers of which the largest being a national battery system company that employees approximately 1,350 people. The urban households in this community have a median income of $25,949 which is dispersed to $19,329 per capita. Although the area has undergone unprecedented growth, there is a disproportional amount of underemployment and poverty due to a lack of economic diversity.

The ethnic composition of the community is by majority White. According to City Chamber of Commerce (1996), the racial mix consist of 61.3 percent White, 29.6 percent Black, 5.9 percent Hispanic Origin, 2.9 percent Asian/Pacific, and .30 percent other. Of the community population, 60.3 percent are of school age.

The high school was originally founded in 1900. The campus is spread across a large area, containing 19 buildings, some dating from the mid-1950s with additional buildings added throughout the decades including the latest completion in 1997. The main buildings or wings were independently constructed. These brick, two-story wings contain twelve classrooms with each room's door opening to the outside. Some of the rooms have connecting doors and all wings are connected by long roofed walkways. The County School Board has planned to build an additional ninth grade center on the high school campus to be opened by January of 2000. This ninth grade center will house approximately 550 students for their core classes. Such courses as physical education and science will be housed in the main building already in place. According to the School

Public Accountability Report (1996-1997), it was stated that the high school enrollment is 2030, making it the largest public school in the county. The total number of students per grade consisted of 584 ninth graders, 535 tenth graders, 444 eleventh graders, and 467 twelfth grade seniors. The ethnic make up of these students are 62.7 percent White, 28.5 percent Black, 5.5 percent Hispanic, 2.9 percent Asian, .27 percent Indian, and .13 percent multicultural. The high school's enrollment, for the most part mirrors the racial, ethnic, socioeconomic diversity of the community.

The academic preparation of the instructional staff is typically varied. Of the 98 member instructional staff, 36 teachers hold Bachelor's degrees, 57 teachers hold Master's degrees, 2 teachers hold Specialist degrees, and 3 teachers have earned a Doctorate degree. The teachers' years of experience include 28 teachers who are in their first to third year, 25 teachers who have taught from four to nine years, and 45 teachers with ten or more years of experience.

The high school has an adequate staff consisting of 98 teachers, 1 principal, 3 assistant principals, 6 counselors, and 4 media specialist. The staff is ethnically made up of 10 black teachers/staff (5 female and 5 male), and 102 white teachers/staff (65 female and 37 male). Presently there are 112 professional and 44 auxiliary personnel.

A number of special programs and collaborative partnerships with businesses and other institutions offer enhanced learning opportunities to the high school students. These include Advanced Placement, Pre-Advanced Placement, Cooperative Business Education, Diversified

Cooperative Education, ESOL District Secondary Center, Exceptional Student Education, Community Based Training, and the Institution of Health Professions Magnet School.

The high school instituted the Advanced Placement program in the county in 1968. This program offers rigorous, college-level courses to the most capable students. These students regularly engage in extensive analysis and research, producing multi-source papers and projects from a variety of media, using many of the latest technological advances. The school now offers a total of 16 AP courses, with a 1997 enrollment of 444 students. Participating colleges and universities all over the United States award either 3 or 6 semester hours of college credit for students scoring a 3 or higher on each AP exam. In 1997, 244 students took 298 exams. The Pre-AP program offers advanced and intellectually challenging material to freshman and sophomores in preparation of the AP courses. Students are selected for Pre-AP courses on the basis of ability and motivation.

The Cooperative Business Education program provides students the opportunity for career preparation in one of the largest and fastest growing areas of our modern business community, clerical and office management. Students are enrolled in academic and related-study classes for one-half of the school day and receive paid, on-the-job training during the other half.

The Diversified Cooperative Training program prepares students for employment in a variety of occupations based on the needs and desires of the student. Classroom instruction includes employability skills as well

as instruction specific to the student's chosen career. Students work in the afternoon and attend classes in the morning.

The high school is the ESOL District Secondary Center which serves 59 students speaking 13 languages. Nineteen countries are represented by students in the program. Paralleling this vitally important program is the high school's Exceptional Student Education program which serves approximately 190 (ESE) students. Programs are provided for students who are educably mentally handicapped, trainably mentally handicapped, specific learning disabled, emotionally handicapped, hearing impaired, physically impaired, autistic, and speech/language impaired. A job training program offered at the high school for these exceptional students, Community Based Training is a cooperative program among the school, community agencies and local businesses. Using the community as a classroom, students move through progressive levels of job training with the ultimate goal of competitive employment prior to graduation.

The curriculum exposes the students to a broad range of knowledge. In addition to the vocational, business, general academic subjects, and vocational job preparatory curriculum programs, dual enrollment programs are also offered. The Florida Academic Scholars' Certificates and Florida Vocational Gold Seal endorsements are available for students that demonstrate excellence in academic achievements. At the end of the 1996-1997 school year, 44 students had received the Florida Academic Scholars award and 64 students were the recipients of the Florida Vocational Gold Seal award. To aid in developing well

rounded students, the high school offers approximately 43 activities, including clubs and athletics.

The subject of computer programming in Logo is presently taught and incorporated in the Practical Computer Skills course which is open to ninth through twelfth grade students. Topics are presented in 50 minute classes five days a week. During the past semester period, instruction was divided into two main structures. The first 12 weeks of the semester pertained to graphic computer language programming, Logo. The last 6 weeks was used to present the fundamentals of computer applications. Lectures, visuals, programming examples, test, and evaluation and performance activities were used regularly. The objective of the Practical Computer Skills: Logo section of the course was to expose the student to a higher order of logical thinking skills. These problem solving skills consist of critical thinking, problem-solving strategies, evaluation and analysis, and creativity which can simply be called "common sense". Students are expected to retain these problem solving skills so that they might be applied to current, everyday events in helping to determine possible outcomes and decisions. During this school year, approximately 31 percent of the students were predicted to fail the Practical Computer Skills course. Of those who would fail, surveys suggest that the main dislike and lack of motivation is derived from boredom. This failure impacts on the student's performance in other secondary courses, post-secondary work, and perceiving the overall structure of the American society and how it relates through life.

The practitioner, a certified secondary business education, computer science, and social studies teacher, is completing the first year of secondary instruction without any previous public teaching experience. The practitioner has the responsibility of teaching three Practical Computer Skills and two Keyboarding/Document Processing classes in a manner as to intrigue and motivate the students to grasp and retain the information presented.

Problem Statement

The target group selected by the author for this project was a mixed ninth through twelfth grade class of 22 students. According to information gathered from previous years, prior experience, and other county personnel, 53 percent of the students enrolled in the Practical Computer Skills course will fail the Logo section causing a lower course average for many of the students which leads to approximately one-third of the target group failing the course entirely. Therefore, by use of those statistical projections, 7 students of the target group should not have passed. This project was aimed to decrease the failure percentage of Practical Computer Skills students, during the Logo section, as well as improving the test scores, programming assignments, and final course grade by stimulating interest and motivation, demonstrating and presenting detailed Logo programs, and through the utilization of technology.

Although, the Practical Computer Skills course is an elective part of the curriculum for secondary schools, these essential computer skills will be utilized later as the student enters the work force. Several factors unique to the fast-paced environment of modern students make traditional instruction inadequate and boring. The influences of modern technology are producing havoc on traditional instruction techniques such as lectures and routine reading assignments. The goal of this instruction was to present the graphical programming language of Logo through a logically structured, hands-on approach. As new instruction was presented, fully detailed Logo programs covering the new material were demonstrated and used as examples. These detailed Logo programs accompanied with

the use of multimedia and technology such as video and the Internet should have produced interest, motivation, and a desire for students to further investigate the graphic ability of the Logo turtle. These Logo computer programs were designed and prepared by the instructor so that other course materials would correlate properly with the unit's objectives and lesson plans.

After acquiring further information, the author discovered that the majority of students enrolled in the Practical Computer Skills course could not logically breakdown a problem into a structured, step-by-step, format so that it might be successfully solved. According to Moffett, county Director of Instructional Technology, problem-solving methods are not emphasized strongly enough at the secondary level which has resulted in many students not being able to demonstrate the mastery of a logically structured curriculum. The first major obstacle that had to be overcome was to determine if the students had been previously exposed to structured problem-solving strategies. The second was to provide stimulus for removing the stereotyped boredom stigma and lack of interest which accompanies computer programming languages. In order to determine and confirm these problems, a general knowledge pre-test of problem-solving strategies and Practical Computer Skills: Logo was administered to the 22 target students. Additionally, a candid attitudinal survey of students' opinion of computer programming languages was given.

An improved program of using technology had to be designed and implemented for the Practical Computer Skills: Logo curriculum to

increase test scores and to achieve a higher percentage of passing students. There was a need for students to comprehend and develop problem-solving skills so that it might be applied to present day decisions and events. Through the use of detailed Logo computer programs, utilization of multimedia, and computer technology into the Practical Computer Skills: Logo classroom, students' interest and motivation to learn should have been increased and boredom decreased. By the use of those technologies, 85 percent of the target group should have passed the course as well as an increase of 10 to 20 percent on the test scores should have occurred.

Outcome Objective

The author's ninth through twelfth grade Practical Computer Skills: Logo target group was paced simultaneously to cover the same material as the other Practical Computer Skills: Logo classes. Usually dry, persistent, and routine assignments of reading often results in the students becoming bored, restless, and basically rebellious. Students will retain more of the material if it is graphically introduced through the use of technology. Many students tend to have anxiety and difficulty with lengthy written essay exams. As a result, evaluations were done by designated problems presented and then solved by the students writing a Logo program, short answer handouts, a written five page research paper compiled through the use of online electronic library resources, and a 50 question matching/multiple choice/true & false exam.

This project concluded that the more involved the student became in solving a problem through a media such as the computer programming language of Logo, the more knowledge he/she would obtain. This retained knowledge will help the student to logically answer or solve common problems that individuals must overcome each day. An overall structured approach of common problems are evident in the American society and how the student can successfully solve and relate the outcomes should have begun to emerge. This knowledge and/or skill may be used as a tool throughout life. Distinct differences in students' performances should be evident between the target group and the other traditional classes. It was the intent of the author to successfully achieve

the following objectives with the ninth through twelfth grade Practical Computer Skills: Logo target group:

1. After twelve weeks of demonstrating detailed Logo programs, multimedia, and utilization of computer technology in the Practical Computer Skills: Logo curriculum, the students of the targeted group will evaluate and illustrate a philosophy of programming in Logo by researching and writing a five page paper with 90 percent accuracy.

2. After twelve weeks of demonstrating detailed Logo programs, multimedia, and utilization of computer technology in the Practical Computer Skills: Logo curriculum, 85 percent of the targeted group will show at least 20 percent improvement in their attitude toward Practical Computer Skills as evidenced on a candid attitudinal survey by rating three on a five point Likert Scale.

3. After twelve weeks of demonstrating detailed Logo programs, multimedia, and utilization of computer technology in the Practical Computer Skills: Logo curriculum, 85 percent of the targeted group will show at least 20 percent improvement in their knowledge of Practical Computer Skills as evidenced by scoring 70 percent or more on the General Knowledge Post-Test.

4. After twelve weeks of demonstrating detailed Logo programs, multimedia, and utilization of computer technology in the Practical Computer Skills: Logo curriculum, 85 percent of the targeted group will pass the Practical Computer Skills course as evidenced by accumulated and averaged scores on end of term report card.

5. After twelve weeks of demonstrating detailed Logo programs, multimedia, and utilization of computer technology in the Practical Computer Skills: Logo curriculum, the students of the targeted group will demonstrate the mastery of dividing a given problem into a structured, step-by-step, format so that it will be successfully solved by writing a final Logo program with 95 percent accuracy.

CHAPTER II

Research and Planning Solution Strategy

Research

High school students are expected to achieve a level of academic proficiency and gain sufficient social and emotional maturity to benefit from instruction at the next level. According to the county School Board (1995), with sufficient motivation, it is expected that the majority of students who receive appropriate instruction in the public schools can make satisfactory progress through the grades.

However, for a variety of reasons this does not always occur. Practical Computer Skills: Logo should be designed to expose the student to an environment where problem-solving may be explored. These experiences should help the student find and develop answers of how and why American society functions in the manner that it does. This knowledge may be applied to everyday events that will help to foster decisions and manipulate outcomes for a successful life.

If the study of structured problem-solving strategies is foundationally important to the growth and development of all children, then why are large percentages of students failing? According to the 1996 School Board Pupil Progression Plan, only 64 percent of twelfth grade seniors had attained at least the basic level of structured problem-

solving strategy skills and could demonstrate partial mastery of a Practical Computer Skills course. Using these statistics, 7 out of the 22 student target group should have failed. Among the different regions of the United States, high school seniors in the Southeast scored the lowest average. To dig the hole deeper, twelfth grade students attending public schools displayed lower scores than their counterparts attending non-public schools (Williams, 1995). Once again, why are the students failing?

Improving Practical Computer Skills test scores may be more indepth than just becoming a better teacher and trying harder. Real growth in student achievement happens when students decide to do better, when parents and families support them, when teachers bring creativity to the classroom and when administrators, policy makers, and community members require, encourage and support the fulfillment of the greatest expectations (Belair, 1995). When parents have access to technology at home or at work, they can become more closely involved in their children's education (Peha, 1995). Parents want their children to use computers. They like to feel that their children are getting a state-of-the-art education (Butzin, 1992). But they have great anxiety when the children do not bring home lots of worksheets and papers. What did you do at school today? We played with computers and games, say the children. Parents then begin to pressure the teachers to get down to basics. The children need to learn to work, they say. Effective computer integration requires parent education. If technology is used to support teaching and learning that extend beyond the walls of the school into the

community, into the workplace, into the family, then it will also have an enormous impact on education and learning (O'Neil, 1995). The Educators must strive to bring intrigue and motivation back into the classroom. Schools are under pressure from society to create a quality curriculum with additional components which go far beyond that expected 15 to 20 years ago (Ehrlich and Reynolds, 1992).

Traditionally, subject matter has been regarded as a fixed body of knowledge which all people needed to know. More recently, educators have realized that, in a world in which the amount of knowledge increases geometrically, in which no one can keep pace with it, the emphasis needs to change from what to learn to how to learn. Because knowledge in the future will have a short half-life, future-oriented educators advocate the shift from a view of learning as the passive acquisition of discipline-based subject matter to one of process -- the active seeking of knowledge by each student (Benjamin, 1989).

Over the past decade, vast numbers of school districts have reconsidered their K-12 curriculum in terms of students' learning experiences with computers. Some estimates put technology spending in K-12 public schools at $4 billion, twice the amount spent on textbooks (Kaplan and Rogers, 1996). Almost every state has established either high school graduation requirements or guidelines for students' computer-related learning according to "Update: The Latest Technology Trends in the Schools" (1993).

Technology in and of itself is not a solution to educational problems. In some schools, technology is only a small but essential part

of the reform equation. The other essential part is a new curriculum. Schools can no longer afford to slap technology onto a curriculum designed for the 19th century classrooms. The technology tools for the 21st century must be coupled with new visions about the work of teachers and students (Bruder, Buchsbaum, Hill, and Orlando, 1992). Teachers should use new technologies wisely, taking advantage of its substantial strengths in promoting basic skills, while not over looking the importance of the human factor in education (Velleman & Moore, 1996). Basic skills are greatly emphasized by schools because students must have solid fundamental reading and writing skills upon which to build the comprehensive communication skills necessary for success in the 21st century. Similarly, students must have sound computational knowledge in order to achieve equity in mathematics where new technology has changed the very nature of the problems important to mathematics and the methods mathematicians use to investigate them (State Department of Education, 1996).

Both proponents and practitioners are finding that technology can play an important role in many aspects of cooperative learning for students. On the surface, the two modalities may not seem compatible. Cooperative learning is a structured process built on the belief that we learn better when we learn together (Bruder, 1992). The traditional computer education model positions one child working alone at a computer. But, in fact, as most teachers know that computers offer ideal opportunities for students to work in small teams where they can talk through problems as they work.

Computer and communications technology have each developed in recent years to offer individual tools that have the potential for improving the quality of education. Together, these tools generate a combination that has even more potential. Educators should be made aware of the power to form "virtual communities" on the World Wide Web (Dyrli, 1997). The "virtual communities" can extend a teacher's professional community in many positive ways. Among the hundreds of newsgroups and discussion groups using e-mail are numerous virtual education communities. One example of a thriving international online community brings together educators teaching and learning the easy-to-learn computer language of Logo. Messages easily composed and transmitted can replace face-to-face meetings in faculty offices. Experts from afar can be drawn into virtual classrooms to stimulate deeper learning from extended interaction. Performance assessments can be collaborative and provided frequently to improve performance. Friedman and Kahn (1994) determined that a complex link existed between the technical and social worlds. Computer technologies provide a medium for the activity that can shape the social infrastructure of society. Personal computers are infinitely patient teachers, willing to repeat a lesson as many times as a child wants and needs according to "Electronic Teachers" (1997).

As problem solving becomes more integral to mathematics curricula, educators have increasingly focused on the process of developing a higher order of thinking skills. Those skills now regarded as "higher order" (critical thinking, problem-solving strategies, evaluation and

analysis and creativity) will be basic skills needed for the 21st century (Yelland, 1995).

Learning environments need to be created where children can engage in problem solving and explore, take risks and apply their knowledge in new and creative ways. Logo, a computer programming language developed by Seymour Papert, with his colleagues at MIT, can help teachers achieve such an environment.

Logo has developed, over the years, into a very effective learning tool, which incorporates all the curriculum areas rather than just a problem-solving tool for math purposes. A tool for creative exploration, Logo is also an interactive programming language that helps individuals learn from their mistakes (Sharp, 1993).

Logo's increase in popularity began in the 1980s when new versions of Logo written for microcomputers started to appear in classrooms across the country. The transition from mainframe and timeshared computer systems to microcomputers was a significant change and led to the growth in popularity of Logo. The most significant and popular change made in the Logo language was the addition of turtle graphics (Yoder, 1994). The turtle graphics allowed the student to see the results of their programs in a graphical presentation. Some classroom teachers use Logo to create designs that can help the child develop an intuitive sense of logical patterning. Logo is a valuable addition to any curriculum if the teachers learn the importance it carries in all subject areas. Even though Logo has a history in education since the 1980s, the

evidence that Logo can improve problem solving and effective skill development is inconclusive as to the effect on the student.

Logo offers many opportunities for problem solving on various levels. Consequently, learning can be as complex or as simple as the learner desires. Children gain expertise in problem solving and thinking skills in an interesting context that will help them become more flexible and creative learners.

According to Papert (1980), Logo creates an environment where children are free to explore and discover. They can learn geometric concepts, actively test and retest their theories, and improve intellectual development. The majority of schools' mathematics programs have nothing to do with reality because the students are taught in a rote meaningless way. According to Papert (1980), this is the reason most children grow up hating and fearing mathematics. Logo combats this problem by letting the child experience a meaningful mathematics environment. Innovative mathematics instruction and the use of computers for problem-solving give importance to the implicit role of education (Wentworth and Monroe, 1996).

Logo has been used in all areas of the curriculum, even though the majority of programs in schools have focused on it as a tool to teach mathematics. Using Logo, the student can explore mathematical ideas such as simple geometry concepts, estimation skills, and topology. Students who learn Logo in school are found to use both debugging and procedural skills (Poulin-Dubois, McGilly, and Shultz, 1989). Educators except the Logo philosophy because it can easily adapt to different

teaching curriculums. Logo can be used as a springboard for many problem-solving activities. Simply allowing children to explore Logo and develop their own projects enables them to learn at their own level.

Logo constitutes a valuable learning environment for promoting higher order thinking skills. It allows children to work on activities that they have generated themselves, as well as on tasks designed by the teacher. Learning in such an environment is characterized by collaborative teamwork and support from the teacher, whose role becomes more of a facilitator rather than dispenser of all knowledge. Learning programming and learning about technology is not only good for its own sake but also because it is supportive of other types of learning (Kafai, 1996). Potentially, the Logo experience enables children to develop reasoning and logic skills and promotes development of flexible and creative thinkers.

Multimedia technology has the components required to create effective instruction in a format that is suited to today's learners (Hirschbuhl, 1992). Multimedia, in the past, has simply referred to the combination of several media or methods of communication to present information, but in the 1990s, multimedia has taken on a new meaning. Multimedia is a revolution in interactivity, quality, and empowerment that is sweeping the nation (McGowan & McCullaugh, 1995). It is a powerful form of communication which involves the integration of various media.

Multimedia can be a powerful educational tool. Surveys have shown that people retain about 10% of the material represented in text alone, but with the addition of other media such as interactive sound,

graphics, and video, that retention jumps to nearly 50% (Tway, 1995). Computers often provide the ideal learning environment due to their infinite patience, positive reinforcement, and ability to tailor themselves to the learning pace of each user (Campbell, 1994). When multimedia is added to a computer's capabilities, the educational value is dramatically increased which is supported by two fundamental principles. Initially, multimedia builds on the premise that people learn more effectively through a combination of external presentations. Secondly, a higher level of learning occurs when students are actively engaged in the learning process. Because of the interactivity of certain multimedia software, the student is prompted into being an active learner instead of a passive one.

Technological advancements have exerted virtually no influence in education, resulting in a need for updating and adjusting the curricula (Wand, 1995). Educators continue to practice the old-fashioned method of learning spelling and mathematics through memorization. Compared with traditional instructional methods, developing a multimedia lesson involves a more complex and labor-intensive design process. Instructors who are new multimedia users can get sidetracked by the glitz, glamour and technical aspects of this technology (Howles and Pettengill, 1993). One can easily lose sight of the most important element, quality instructional design. The use of multimedia technology in schools has been plagued with a number of problems. One such problem includes the unavailability of funds needed to purchase multimedia technology. Secondly, many veteran teachers have not yet obtained the necessary skills to use and develop multimedia presentations. Developing quality

multimedia courseware is too difficult for 98% of all school faculty (Solomon, 1994), Another aspect to consider is the overburdened responsibility of the teacher: how is a teacher going to find the time to learn and devise multimedia presentations? The average time to put together a decent multimedia presentation is from 200 to 400 hours. Consequently, most teachers who begin the process of developing courseware presentations give up soon into the process.

Multimedia is entertainment that may effectively mesmerize its audience with spectacular presentations. One of the teacher's first responsibilities is to motivate students to learn and multimedia presentations do address this concern, but at what learning value? Some critics question the value of multimedia, claiming that it is all form and little substance. Teachers who prepare these presentations spend enormous amounts of time and energy preparing their presentations to look professional that might be diverting time away from indepth content.

After having reviewed the relevant literature and studied alternative solutions, the author implemented graphically designed Logo programs, utilization of multimedia, and computer technologies into the Practical Computer Skills: Logo target group. This should have dissipated the dry, persistent, and routine reading assignments that are traditionally presented. Intrigue, curiosity, and motivation of the student should have return to the classroom.

The materials and programs that the author used in this practicum consisted of items that could be operated or understood after specific instructions. A teaching method or methods that included visual and

audio presentations were used to present the topical material in the best possible manner for the learner to retain the most knowledge presented. Evaluations were done by designed problems presented and then solved by the student creating a Logo program, short answer handouts, and a written five page research paper. The problem-solving exercises should have helped to sharpen the student's skills of successfully solving common problems that are encountered everyday. The goal of this innovative approach was to expose and captivate the students' attention into expanding their knowledge of how to logically breakdown and solve a given problem.

Planned Solution Strategy

Considering the research and methods analyzed, the strategy selected by the author involved a variety of approaches. One method was to use integrated curriculum. This helped students make connections from one area of study to another. Integration of the curriculum provided the opportunity to pursue topics in greater depth from different perspectives and creates an environment where the student's natural inclination is fostered. An overall connection was made of past happenings that should have related to more modern applications. Thematic instruction subordinates content or subject-area skills and topics to larger concepts which run as a theme through various content areas (Rhodes, 1990).

To help reach all students in the target group, the author primarily used the teaching method of Learning to Learn. This approach was more active seeking of knowledge by each student, emphasizing learning about the process of learning rather than learning just isolated facts. According to Benjamin (1989), this method is moving from knowing to a searching emphasis with less memorization of facts and more locating, assembling, interpreting, and using facts and data. The concept emphasizes developing the joy of curiosity and necessity for lifelong learning.

In a world that is constantly changing, there is no one subject or set of subjects that will serve for the foreseeable future. The most important skill that a student could acquire is learning how to learn. If students know how to learn, they can adapt and change no matter what technological, social, or economic permutations occur. Learning requires

openness and curiosity. Learning how to learn requires humility in recognizing that one does not already know it all. Discovering by trial and error of where to look for information is the first step in understanding what a large portion of modern technology requires for success.

After the implementation of graphically designed Logo programs, utilization of multimedia, and computer technology, the students should have excelled and developed learning skills that should continue to be beneficial throughout life. Practical Computer Skills: Logo does not have to be a boring and useless waste of time. The author projected that with the correct delivery and presentation, learning structured problem-solving skills would become fun.

CHAPTER III

Method

The goal of this practicum was to improve secondary test scores of the Practical Computer Skills: Logo section of the course. An implementation program that demonstrated teacher designed graphical computer language Logo programs, utilize multimedia techniques, and used modern computer technology in conjunction with the Learn to Learn teaching style was introduced in the Practical Computer Skills course as a supplement to the traditional style of dry and monotonous lecturing.

Prior to the implementation of this project, the author sought council and advice from the high school's Technology Committee for a formative planning-strategy discussion. The Technology Committee consisted of 25 school faculty, administration, and support personnel members and the county Director of Instructional Technology. The committee is facilitated by the school's head Media Specialist/Technology Coordinator. Their main goal is to assist in preparing students for entry into the workforce and/or post-secondary education after graduation, through the use of many modern technology tools of learning and instruction. The committee meets bi-monthly on "Techno-Tuesday" for approximately one to two hours depending on the agenda. Other last-minute meetings are sometimes arranged if an important gathering is needed or required. The

committee found that this technology project was very worthy of implementation and the program results should have a valuable impact on the future criteria of the course curriculum.

A 12-week implementation program was designated for this technology project. The target group which participated in this program was a typical ninth through twelfth grade class of 22 students. Topics were presented in 50 minute classes, five days a week. Program instruction and activities were conducted for each of the 50 minute classes.

During the first week of implementation, a general knowledge (Appendix A, p.56) and a candid Computer Programming Language Attitudinal Survey (Appendix B, p.59) were administered to the target group. The Pre-Test served as a preassessment tool for determining the students' knowledge of problem-solving strategies and Practical Computer Skills: Logo prior to enrollment. The candid Computer Programming Language Pre-Attitudinal Survey was used to determine how the student views computer programming. Results from the Pre-Test preassessment tool was discussed individually with students in the target group showing each one's test score, displayed in figure 1 on the next page. These results indicated an average score of 44.5 which is far below the passing scale.

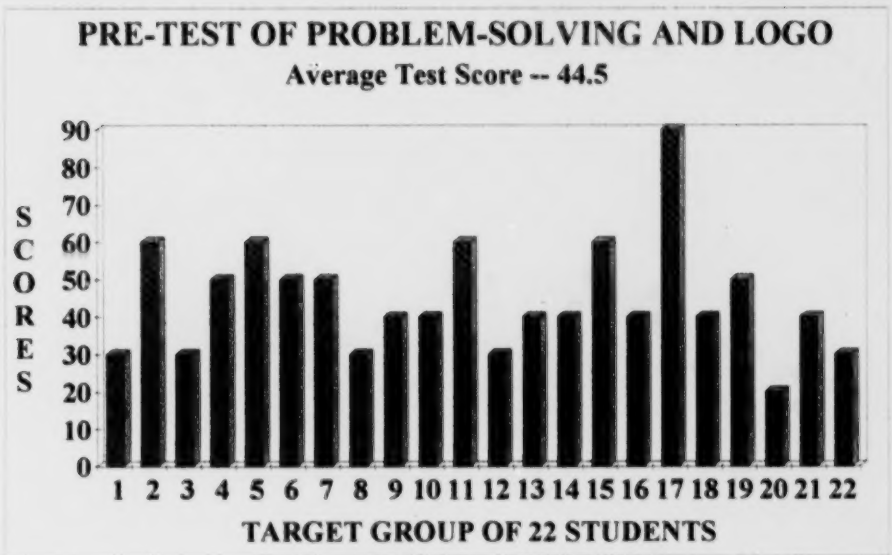

Figure 1

Pre-Test of Problem-Solving Strategies and Practical Computer Skills: Logo

The candid Computer Programming Language Attitudinal Survey was used to determine how the student views computer programming. Results from the Pre-Attitudinal Survey preassessment tool was discussed with each student in the target group showing each one's test score, displayed in figure 2 on the next page. These results indicated an overall percentage average of 69.7% which is below the passing scale.

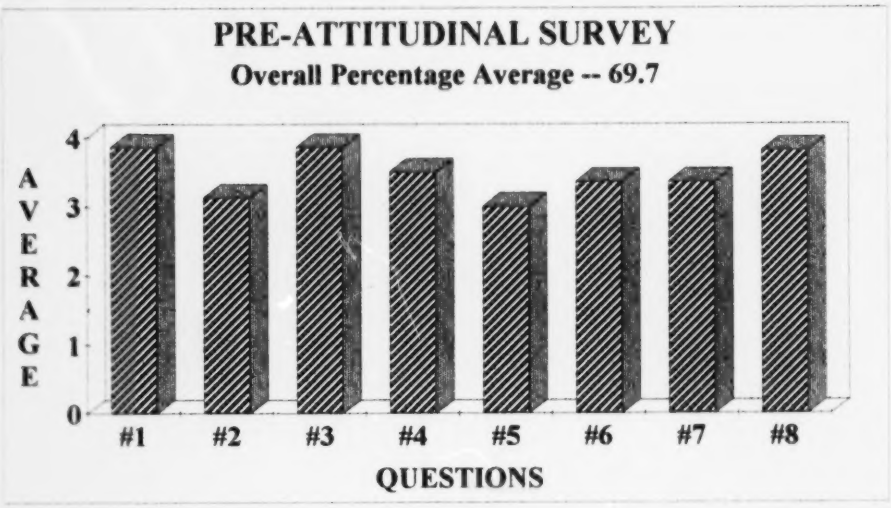

Figure 2

Pre-Computer Programming Language Attitudinal Survey

The second week was devoted to introducing modern computer technologies such as the Internet, online electronic libraries, and the computer's many in-house resources. The students were expected to adequately master these research tools in order to prepare the final written project, a five page research paper detailing with the history and philosophy of Logo. Detailed operating instructions were available for individual study. Each student's chosen topic was reviewed and recorded by the teacher.

The third week was devoted to introducing the computer language of Logo. The history and philosophy of Logo's inventor, Seymour Papert, was presented. The Internet and online electronic libraries were utilized by the students to continue their research that pertained to their final

written project. Many of Logo's basic turtle movement command words were introduced along with specific instructions for the students to copy.

The fourth week was used to present the primary commands of REPEAT, LABEL, COLOR (SETC 0-4 and SETBG 0-9), and WAIT. Three teacher designed graphical Logo programs (Appendix F, p.69) were demonstrated and distributed to the students. These were used to encourage and motivate the students as well as reinforce the lecture material. Assignments 1 and 2 were given during the week as practice and reinforcement of the presented lesson topics.

During the later part of the fourth week, the author met with the Technology Committee, for the second time, and gave a short progress report on how the implementation program was proceeding. A brief discussion followed which allowed for valuable input and advice from the members of the committee that could enhance the results of the project and improve student performance.

Week five was used to present the primary commands of SHAPES, STAMPS, FILL, and SHADE. Three teacher designed graphical Logo programs (Appendix G, p.77) were demonstrated and distributed to the students. These were used to reinforce the lecture material. Assignments 3 and 4 were given during the week as practice and reinforcement of the presented lesson topics. By the end of the week, time was given for the students of the target group to utilize the computer's electronic encyclopedia. The use of this type of multimedia technology intrigued the students' curiosity to investigate their chosen

research subject by the ease and availability of the enormous amount of stored information.

Week six was used to present the technique of writing PROCEDURES. This technique presented the students with a major piece of the programming puzzle that allowed them to begin to create a complex Logo program. The primary command of CTL F (flip side) was presented and demonstrated. Two teacher designed graphical Logo programs (Appendix H, p.85) were demonstrated and distributed to the students. These were used to reinforce the lecture material. Assignment 5 was given during the week as practice and reinforcement of the presented lesson topics.

Week seven was used to help the students design programs that incorporated structured methods to breakdown a problem into a step-by-step format so that it might be successfully solved. Three methods were presented: top down programming, bottom up programming, and middle out programming. One teacher designed graphical Logo program (Appendix I, p.93) was demonstrated and distributed to the students. This was used to reinforce the lecture material. Assignment 6 was given during the week as practice and reinforcement of the presented lesson topics.

Week eight was devoted to study of music. The primary command of TONE and note duration was presented. A handout (Appendix J, p.98) containing note and Logo frequencies, type of note and duration, and note and octave was distributed to the students as reference material. One teacher designed graphical Logo program (Appendix K, p.100) was

demonstrated and distributed to the students. This was used to reinforce the lecture material. Assignment 7 was given during the week as practice and reinforcement of the presented lesson topics.

During the later part of the eighth week, the author met with the Technology Committee, for the third time, and gave a short progress report on how the implementation program was proceeding. A brief discussion followed which allowed for valuable input and advice from the members of the committee that could enhance the results of the project and improve student performance.

Week nine was devoted to study of PRINT statements. The primary commands of TEXT and PRINT were presented. Three teacher designed graphical Logo programs (Appendix L, p.105) were demonstrated and distributed to the students. These were used to reinforce the lecture material. Assignments 8 and 9 were given during the week as practice and reinforcement of the presented lesson topics.

Week ten was devoted to assigning a final programming project to each student of the target group that covered all instructions presented in the Logo section of the Practical Computer Skills course. The students were expected to adequately use all the instructions potentially mastered during the Logo section in a final project. Each student's chosen final project was reviewed and recorded by the teacher. One teacher designed graphical Logo program (Appendix M, p.115) was demonstrated and distributed to the students. This was used to reinforce the lecture material.

Week eleven was devoted to the conclusion of the five page research paper project on the history and philosophy of Logo and continuing progress of the final programming project. All multimedia technology such as the computer's electronic encyclopedia and modern computer technologies such as the Internet and online electronic libraries should have been used to prefect the research paper and final programming project. For a further reenforcement of the topics, students used modern computer technology by connecting to the Internet for an e-mail discussion group on Logo. To join the Logo-L discussion group list, send the message subscribe Logo-L and your name to majordomd@gsn.org. Another important link used was to Seymour Papert, the "father of Logo" at www.connectedfamily.com (Dyrli, 1997).

Week twelve concluded the Logo section of the Practical Computer Skills course as well as the implementation of this project. This week was devoted to finalizing any projects that may have been due and administering the final exam. Students were encouraged to use the electronic encyclopedia, tutorials, presentations, or electronic library to complete the five page research paper. An end-of-subject 50 question final exam (Appendix N, p.128) was given at the close of the week to evaluate the target group's subject knowledge in Logo. Results from the Final Logo Exam were discussed with each student in the target group showing each one's test score, displayed in figure 3 on the next page. These results indicated a class average of 94.23 out of a possible 100 which is in the "A" range.

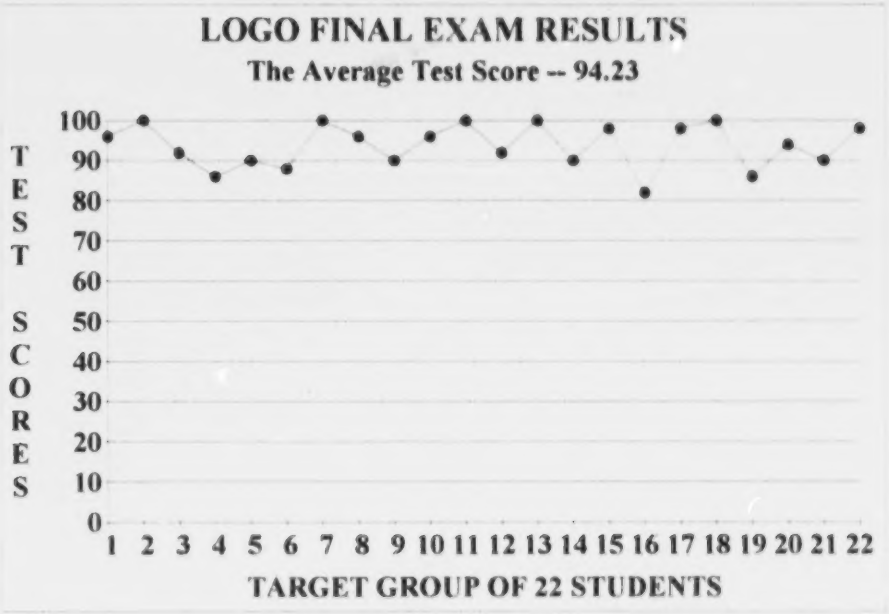

Figure 3

Final Logo Exam Results

Each student's research paper was collected and evaluated according to a letter grade rubric scale (Appendix E, p.66). Each student's final programming project was collected and evaluated according to how well detailed and defined the mastery of the presented subject material was accurately demonstrated by each student in the target group. The author reviewed all instruments and instructional methods used during this practicum. The Post-Knowledge Test (Appendix A, p.56), and Post -Attitudinal Survey (Appendix B, p.59), were administered and reviewed for part of the final results of the target group (Appendix C, p.62). Results from the Post-Knowledge Test assessment tool was

discussed with each student in the target group showing each individual's test score, displayed in figure 4 below. These results indicated an average score of 90.4 which has risen into the passing scale.

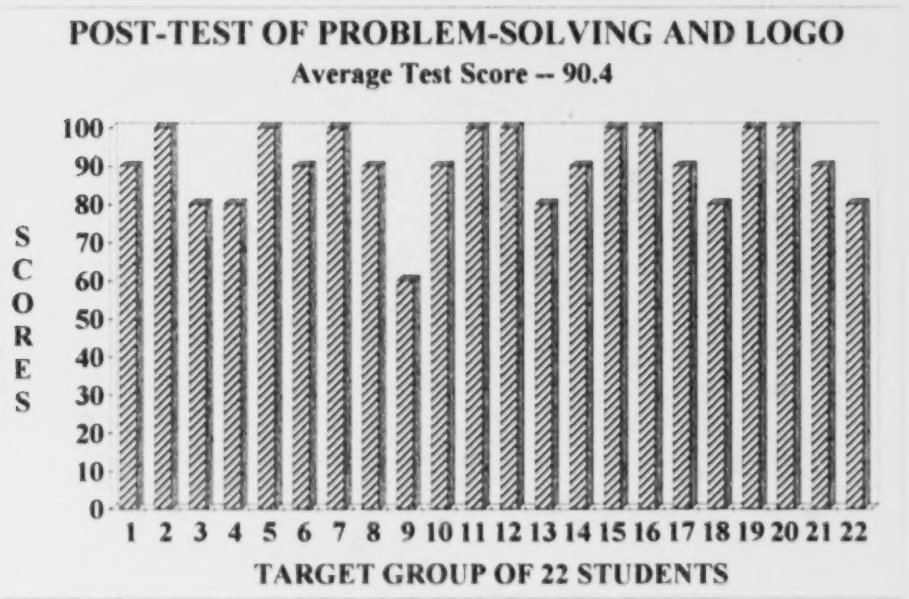

Figure 4

Post-Test of Problem-Solving Strategies and Practical Computer Skills: Logo

The candid Computer Programming Language Attitudinal Survey was used to determine how the student views computer programming. The result from the Post-Attitudinal Survey assessment tool was discussed with each student in the target group showing each individual's test score, displayed in figure 5 on the next page. These results indicated an overall percentage average of 74.9% which is risen above the passing scale.

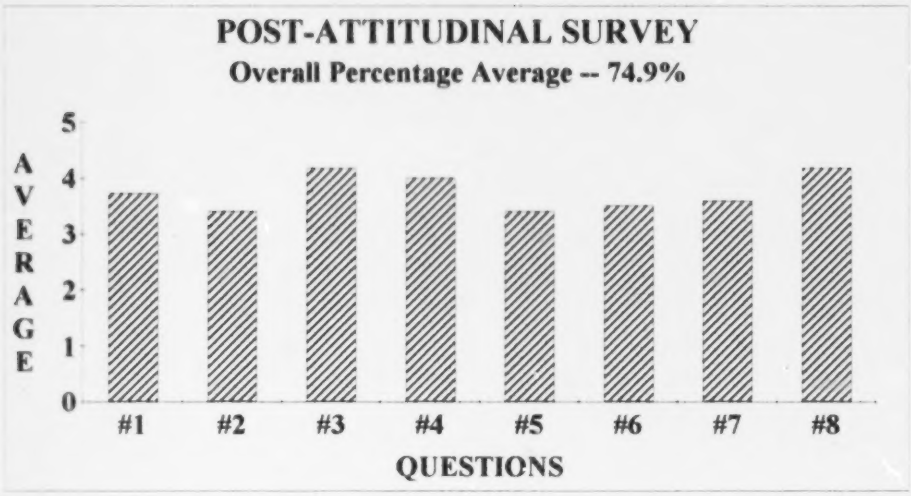

Figure 5

Post-Computer Programming Language Attitudinal Survey

Final Practical Computer Skills course evaluation scores (Appendix D, p.64), were computed by a combination of accumulated and averaged programming assignments, test score, the research paper score, and final programming project score.

Upon completion of the twelfth week, the author met with the Technology Committee and gave a conclusive progress report on the results of the implementation program. A discussion followed which allowed for valuable ideas and suggestions that might be included in the criteria of this project's curriculum for future implementations at this high school and at other schools throughout the district.

Since the results of this practicum was successful, plans have been made to implement a program that will demonstrate teacher designed

graphical computer language Logo programs, utilize multimedia techniques, and use modern computer technology in all Practical Computer Skills classes. The use of computers and technology will only continue to stimulate interest and motivation for computer programming skills. Surveys in future years should reveal that students have a more logical method of separating a given problem into a structured, step-by-step, format so that it might be successfully solved.

CHAPTER IV

Results

The evaluation for the success of this practicum was determined by the author in a number of ways. Different instruments had to be used in order to determine the overall effectiveness of the project. These instruments consisted of a general knowledge Pre/Post-Test of problem-solving strategies and Practical Computer Skills: Logo (Appendix A, p.56), a candid Computer Programming Language Attitudinal Pre/Post-Survey (Appendix B, p.59), and grade averages on the individual report cards (Appendix D, p.64). The instruments were distributed to the target group at the beginning of the project and again after a period of twelve weeks. For this practicum to have been a success, the project must have collectively fulfilled the five outcome objectives previously stated in chapter one. The proposed objectives that were attempted and, for the most part, successfully met were as follows:

1. After twelve weeks of demonstrating detailed Logo programs, multimedia, and utilization of computer technology in the Practical Computer Skills: Logo curriculum, the students of the targeted group will evaluate and illustrate a philosophy of programming in Logo by researching and writing a five page paper with 90 percent accuracy.

2. After twelve weeks of demonstrating detailed Logo programs, multimedia, and utilization of computer technology in the Practical Computer Skills: Logo curriculum, 85 percent of the targeted group will show at least 20 percent improvement in their attitude toward Practical Computer Skills as evidenced on a candid attitudinal survey by rating three on a five point Likert Scale.

3. After twelve weeks of demonstrating detailed Logo programs, multimedia, and utilization of computer technology in the Practical Computer Skills: Logo curriculum, 85 percent of the targeted group will show at least 20 percent improvement in their knowledge of Practical Computer Skills as evidenced by scoring 70 percent or more on the General Knowledge Post-Test.

4. After twelve weeks of demonstrating detailed Logo programs, multimedia, and utilization of computer technology in the Practical Computer Skills: Logo curriculum, 85 percent of the targeted group will pass the Practical Computer Skills course as evidenced by accumulated and averaged scores on end of term report card.

5. After twelve weeks of demonstrating detailed Logo programs, multimedia, and utilization of computer technology in the Practical Computer Skills: Logo curriculum, the students of the targeted group will demonstrate the mastery of dividing a given problem into a structured, step-by-step, format so that it will be successfully solved by writing a final Logo program with 95 percent accuracy.

In order to determine the overall effectiveness of the project, different instruments had to be used throughout the 12-week program. Objective one was achieved after twelve weeks of using modern computer technologies and resources to research and write a five page paper with an evaluation grade of or above 90 percent accuracy. These researching

skills help the students in other secondary courses, post-secondary work, and many areas throughout life. The results of the research paper project indicated that the methods and technology used inspired the students to produce a quality final product, as indicated in figure 6. The target group average score was 94.23 which was an "A" grade. Since the lowest individual was a 70, all students passed the research paper project. The author suggests that the lowest individual grade was acquired through the lack of motivation, non-caring, and little cooperation to complete the assignment as directed. With an overall evaluation grade average of above 90 percent accuracy, objective one was successfully accomplished.

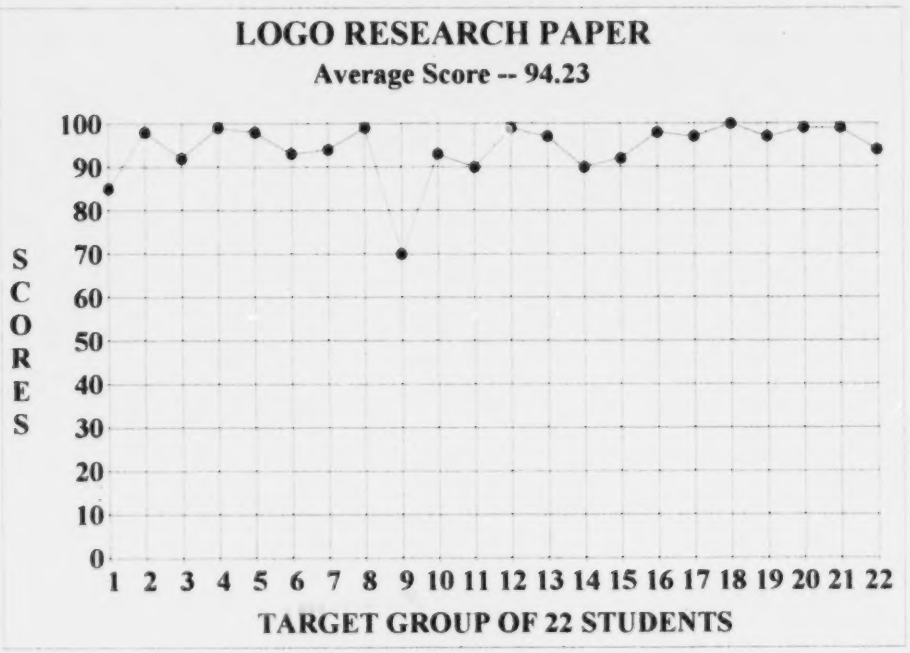

Figure 6
Logo Research Paper Results

Objective two was completed after twelve weeks of daily instruction, which stated that 85 percent of the targeted group showed at least a 20 percent improvement in their attitudes toward Practical Computer Skills: Logo as evidenced by a post-attitudinal survey. The author's intent was to motivate students to change their attitudes toward computer programming and problem-solving through the use of detailed Logo programs, multimedia, and utilization of modern technologies. The Pre/Post Survey results, shown in figure 7, indicate that the overall percentage only increased by 7.5%. Therefore, objective two was not successfully achieved. After closer examination of the evaluation, the author determined that the cause for this objective not successfully being completed, stemmed from the target group's response to the first survey question:

1. Do you feel confident in accurately solving a given problem through structured problem-solving techniques and a logical step-by-step procedures?

The Post-Survey showed a percentage decrease of 2.8% from the Pre-Survey. The author feels that this response was not due to a lack of understanding of how to solve a given problem through structured problem-solving techniques, but rather from the overwhelming concept that the greater the problem is, the more complexed the structured step-by-step solution would be. In essences, a new concept of resolving problems has been introduced to the students and consequently it has lessened their confidence in solving complex problems accurately. Although object two was not successfully accomplished as it was

originally written, its outcome may have shown a more positive and meaningful product for the target group that can only be determned in the years to come.

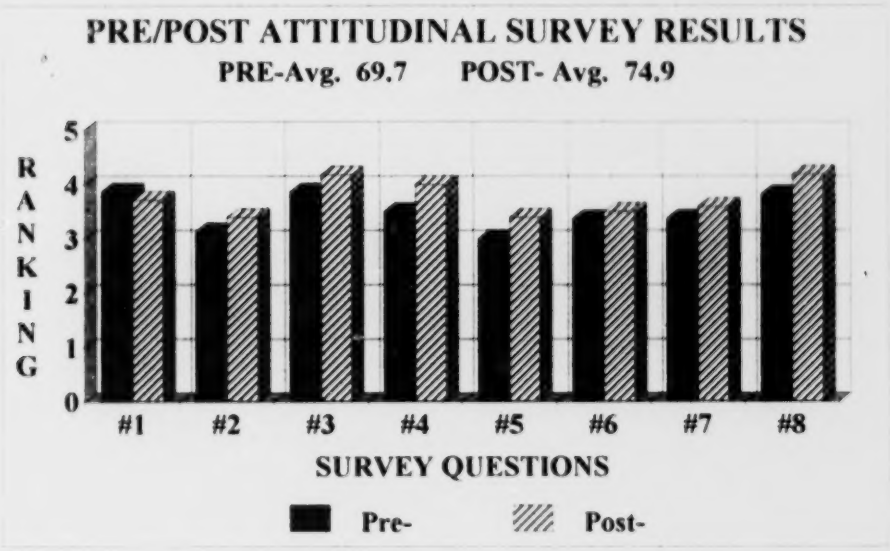

Figure 7

Pre/Post Attitudinal Survey Results

Objective three was achieved after twelve weeks of daily instruction which demonstrated that 85 percent of the targeted group showed at least a 20 percent improvement of their general knowledge in Practical Computer Skills: Logo as evidenced by a post general knowledge test. All of the questions on the general knowledge exam had been covered throughout the Practical Computer Skills course, which showed a positive result and suggests that the project techniques were successful. The

results of the Pre/Post Logo Test indicated that the implementation methods in conjunction with the use of technology has adequately taught the students the desired material to achieve a successful knowledge foundation, as indicated in figure 8. The target group's average score on the Post-Test was 90.4, indicating a percentage increase of 103% from the Pre-Test, and placing the average in the "B" grade range. Since the lowest individual grade was a 60, all other students passed the Post- Logo Knowledge Test instrument except for student nine. This student continued to demonstrate a lack of motivation, non-caring, very little cooperation toward completing the assignments as directed, and participation in classroom activities. Hopefully, a remedy may be found to spark interest in this individual before future courses are taken. With an overall evaluation percentage increase of 103%, objective three was successfully accomplished.

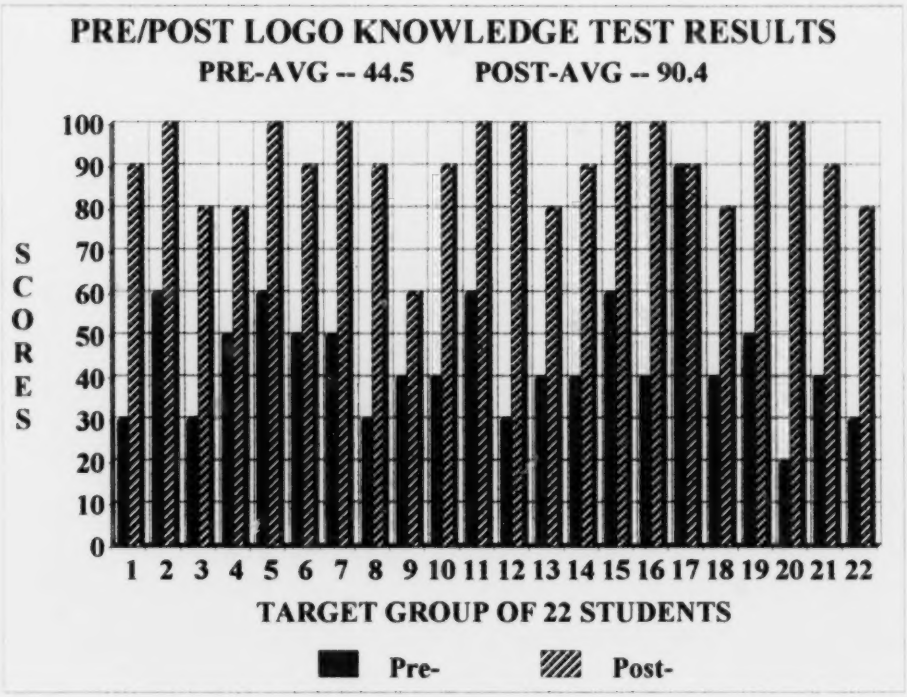

Figure 8

Pre/Post Logo Knowledge Test Results

Objective four was achieved after twelve weeks of daily instruction with the use of detailed Logo programs, multimedia, and utilization of modern computer technologies stated that 85 percent or more of the targeted students had improved their grade average as to pass the course. For many students, the grade point average (GPA) is the most important aspect of school because of the post-secondary potentials. The results of the ending grade average indicated that the implementation program was successful, as demonstrated in figure 9. The overall average for the Logo section of the course was 92, while the overall course average was 89. Of the target group, 77% demonstrated a higher

percentage average in the implemented Logo section over their final Course average. The remaining 23% that demonstrated a higher percentage average in their final course grade seemed to struggle with the concept of structured problem-solving strategies that use a step-by-step format. These students found it difficult to define each step in solving a given problem because of the complexity or multiple steps needed for a successful conclusion. This structured approach demanded a high concern for seemingly irrelevant details that were paramount for solving the problem. This low percentage of students (23%) showed much more frustration and anxiety in retaining the correct solution of a given problem by using a higher order of thinking skills than the other 77% of the target group.

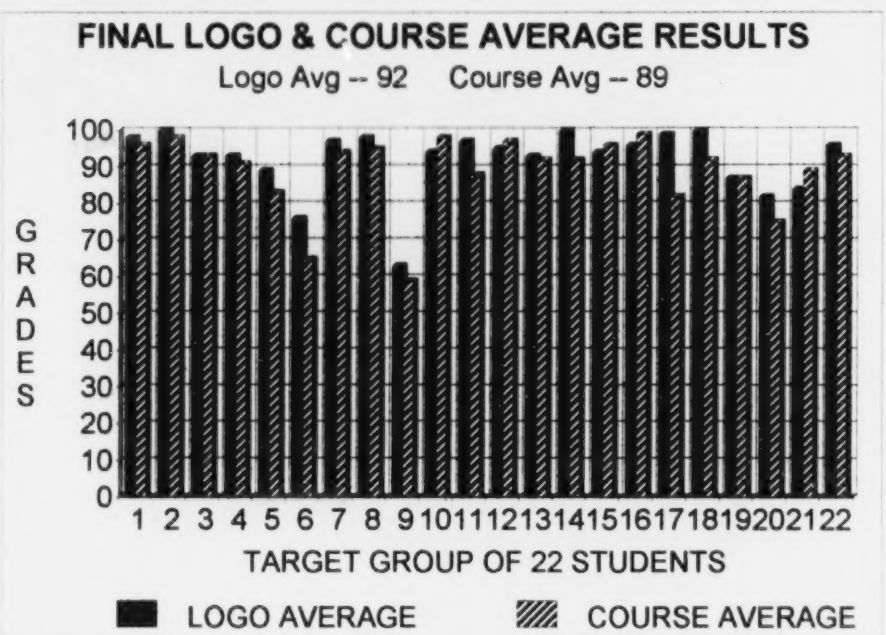

Figure 9
Target Group Logo/Course Grade Average Results

The positive results for objective four was demonstrated by the information provided in figure 10. This graph indicates that the 85% of the Target Group passed the course with a final average grade of "A", "B", or "C". Of the remaining 15% of the group, 5% achieved a "D" and 10% did not successfully complete the course. These statistics demonstrate the overall success of this objective with 90 percent of the targeted students improving their grade average and passed the course.

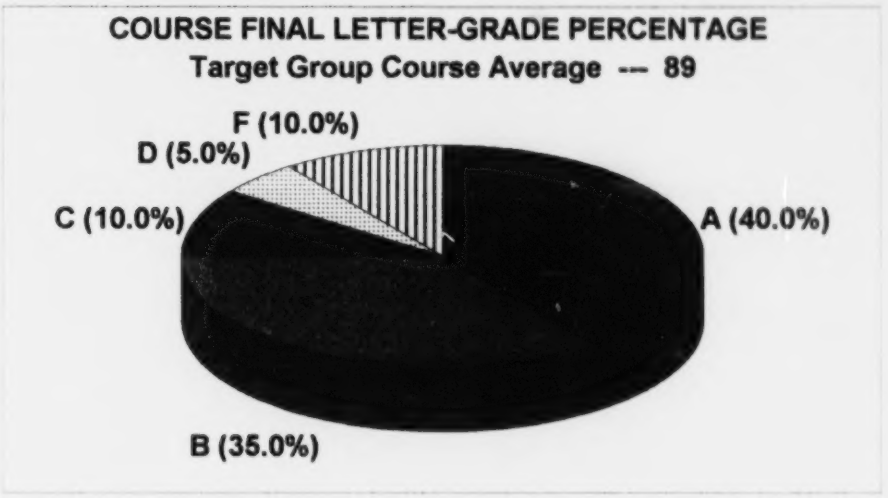

Figure 10

Practical Computer Skills: Logo Course Final Letter-Grade Average Percentage Results

Objective five was completed after twelve weeks of using modern computer technologies. The students demonstrated the mastery of dividing a given problem into a structured, step-by-step, format so that it was successfully solved by writing a final Logo program with 95 percent

accuracy. This was the first step toward increasing an overall understanding of problem-solving strategies that should prove a useful skill for the student throughout their life. The results of the Final Logo Programming Project indicated that the implemented material had helped to inspire the students, even student nine, to produce a quality final project, as indicated in figure 11. These results indicated a project average score of 93.86 which, when rounded, would be a grade of an "A". With an overall evaluation average grade of 93.86, object five was not successfully achieved. Although the object was not met, by only an averaged point of 1.14, the outcome should still be considered a success. The author feels that this object, as it was originally written, might have been placed too high for most targeted secondary groups.

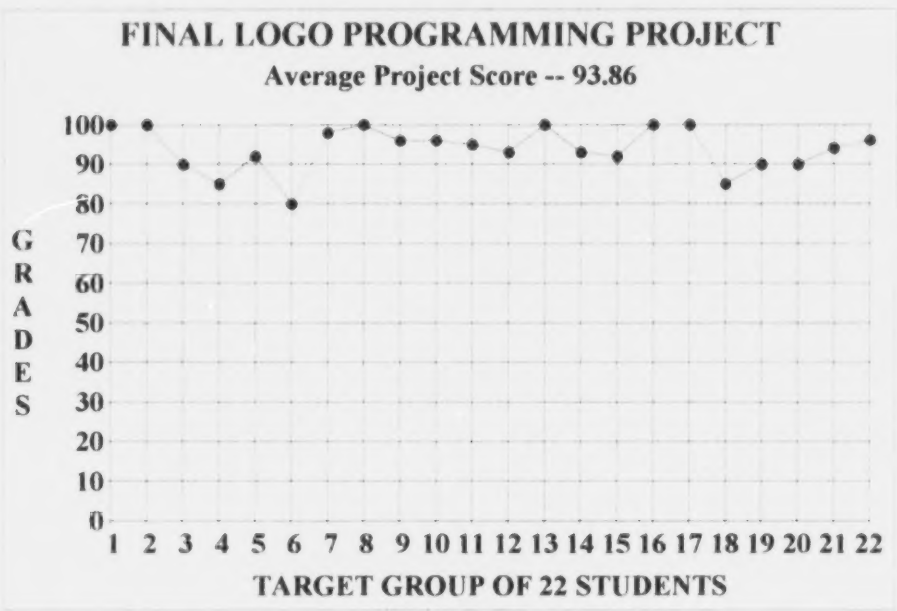

Figure 11
Final Programming Project Results

The implementation of the detailed Logo programs, multimedia, and utilization of modern computer technology project will help the students to comprehend and retain a higher order of thinking skills that may be applied to everyday events. Technology education is important to address the issues of productivity, increase consumer knowledge and awareness, and facilitate rational decisions by individuals on social-technological issues. The product of combining these elements, structured problem-solving strategies and technology, will endow the student with the tools of knowledge for succeeding in today's modern society.

CHAPTER V

Recommendations

Since the results of this project were an overall success, the author has made a recommendation to implement a program into the classroom curriculum that will demonstrate teacher designed graphical computer language Logo programs, utilize multimedia techniques, and use modern computer technology for all Practical Computer Skills classes at this high school. A copy of the project's final report was presented to the Curriculum Director for further examination and consideration for its educational value. Preliminary impressions suggest that these techniques may be effectively used and promoted in all Practical Computer Skills classes starting with the fall semester.

The second recommendation was made for all of the Practical Computer Skills teachers to continue being involved with the Technology Committee as viable members. A copy of the project's final report was presented to the committee for further valuable input and advice from the members that could continue to enhance the program and improve student performance beginning with the upcoming fall semester. Another advantage for being involved with the Technology Committee is the ease of keeping abreast of current hardware and advancing technology methods.

The third recommendation was made to have the implemented program and results placed on file and available for other schools and districts to review. This could easily be accomplished through the county Director of Instructional Technology. By also being a member of the school's Technology Committee, he would have first-hand knowledge of the implemented project and be able to promote and convey the information to other interested schools in the district as well as other neighboring districts.

Technology is a remarkable development that continues to change and improve at an exponential pace. Its possible impact on the curriculum could be staggering, but it needs to be allowed to help develop, nurture, and assist the children that are advancing through the educational system. It is up to the educators to inspire, motivate, and excite students and colleagues as to integrate the computer and modern technology into all aspects of the classroom curriculum.

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APPENDIXES

APPENDIX: A

PRACTICAL COMPUTER SKILLS: LOGO PRE/POST-TEST

APPENDIX: A

PRACTICAL COMPUTER SKILLS: LOGO PRE/POST-TEST

NAME: _____ CLASS: _____

DIRECTIONS: Place the corresponding letter in the space provided.

1. ____ What is the first step in solving a given problem?

   A) Write the answer
   B) Define the problem
   C) Define the solution
   D) Write the procedures

2. ____ In the programming language of Logo, what will this draw:
   Repeat 360 [FD 1 RT 1]

   A) circle
   B) triangle
   C) rectangle
   D) square

3. ____ What command would be used to allow the computer to set the color of the Logo turtle?

   A) Pause
   B) Wait
   C) Random
   D) Choose

4. ____ In order to write procedures on the flip side of a Logo program, what command is used?

   A) CTL F
   B) CTL D
   C) CTL U
   D) ESC

5. ____ What command is used to produce musical notes in Logo?

A) TONE
B) SONG
C) SHAPES
D) MUSIC

6. ____ Which Function Key is used to place a Label on the screen in a Logo program?

A) F6
B) F7
C) F8
D) F9

7. ____ In the programming language of Logo, what will this draw: Repeat 3 [FD 40 RT 120]

A) circle
B) triangle
C) rectangle
D) square

8. ____ What is the last step in solving a given problem?

A) Write the answer
B) Define the problem
C) Define the solution
D) Write the procedures

9. ____ What command would be used to allow the Logo program to pause for a short period of time?

A) Pause
B) Wait
C) Random
D) Choose

10. ____ What command is used to leave or logout of a Logo program?

A) END
B) CTL F
C) ESC
D) DOS

APPENDIX: B

COMPUTER PROGRAMMING LANGUAGE ATTITUDINAL

PRE/POST-SURVEY

APPENDIX: B

COMPUTER PROGRAMMING LANGUAGE ATTITUDINAL PRE/POST-SURVEY

NAME: _____ CLASS: _____

DIRECTIONS: Place circle the level of degree that best answers the question. Refer to the ranking diagram before starting.

Ranking: 1 = NO! Not At ALL.
2 = Below Average.
3 = Average.
4 = Above Average.
5 = Excellent.

1. Do you feel confident in accurately solving a given problem through structured problem-solving techniques and a logical step-by-step procedures?

   1 2 3 4 5

2. How much general knowledge do you have of computer programming?

   1 2 3 4 5

3. Do you have a open attitude toward learning a structured programming language?

   1 2 3 4 5

4. How much do you enjoy successfully solving a problem through a structured series of steps?

1 2 3 4 5

5. Do your friends have a general knowledge of structured computer programming?

1 2 3 4 5

6. How much knowledge of solving a given problem through structured problem-solving techniques and a logical step-by-step procedures is used in everyday life?

1 2 3 4 5

7. What level of structured problem-solving techniques do you posse?

1 2 3 4 5

8. How much knowledge of successfully solving a given problem could you learn through the use of multimedia and computer technology?

1 2 3 4 5

APPENDIX: C

PROJECT PRE/POST-TEST RESULT

APPENDIX: C

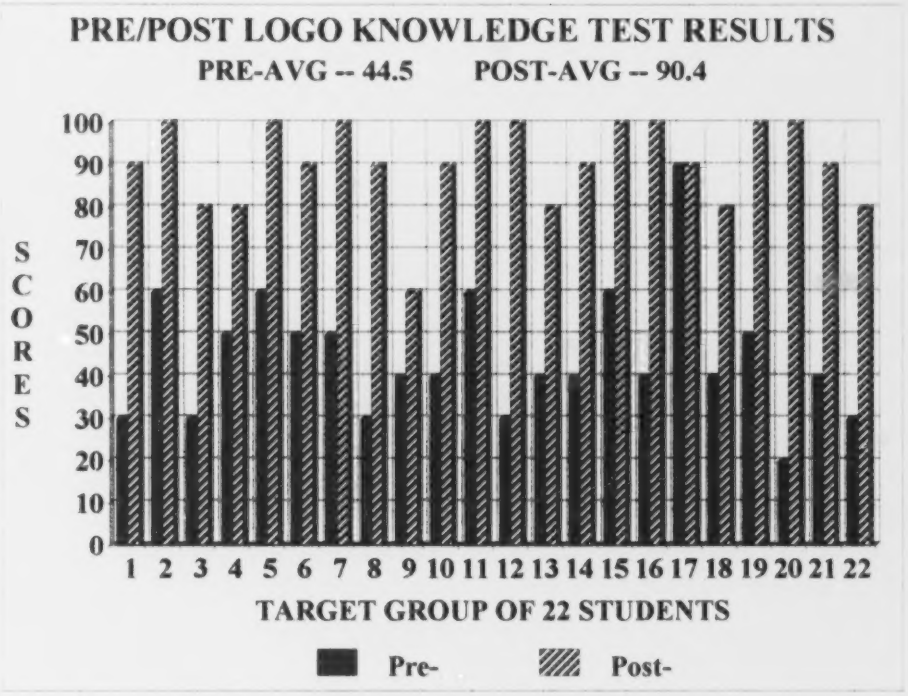
PROJECT PRE/POST-TEST RESULT

DIRECTIONS: This chart represents a comparison of individual students' score by percentage on:

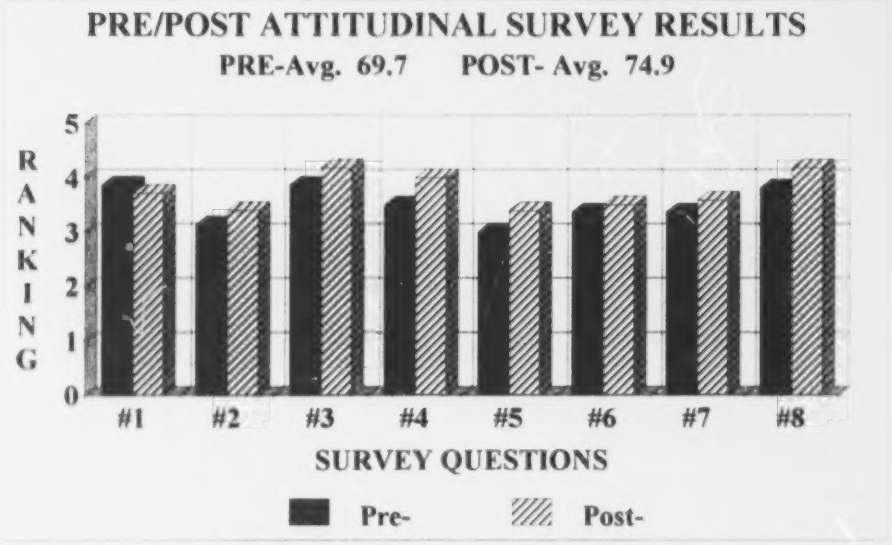
Practical Computer Skills: Logo Knowledge Test
and
Computer Programming Language Attitudinal Survey

STUDENT	PCSLKT(Pre)	PCSLKT(Post)	CPLAS(Pre)	CPLAS(Post)
1	30	90	63%	68%
2	60	100	45%	48%
3	30	80	60%	60%
4	50	80	75%	90%
5	60	100	75%	83%
6	50	90	70%	70%
7	50	100	83%	83%
8	30	90	75%	95%
9	40	60	80%	85%
10	40	90	70%	75%
11	60	100	85%	90%
12	30	100	45%	50%
13	40	80	65%	60%
14	40	90	83%	78%
15	60	100	93%	83%
16	40	100	83%	73%
17	90	90	85%	88%
18	40	80	53%	65%
19	50	100	63%	65%
20	20	100	45%	80%
21	40	90	60%	60%
22	30	80	83%	80%

PCSLKT -- Practical Computer Skills: Logo Knowledge Test
CPLAS -- Computer Programming Language Attitudinal Survey



Pre/Post Logo Knowledge Test Results



Pre/Post Attitudinal Survey Results

APPENDIX: D

PRACTICAL COMPUTER SKILLS COURSE

REPORT CARD

APPENDIX: D

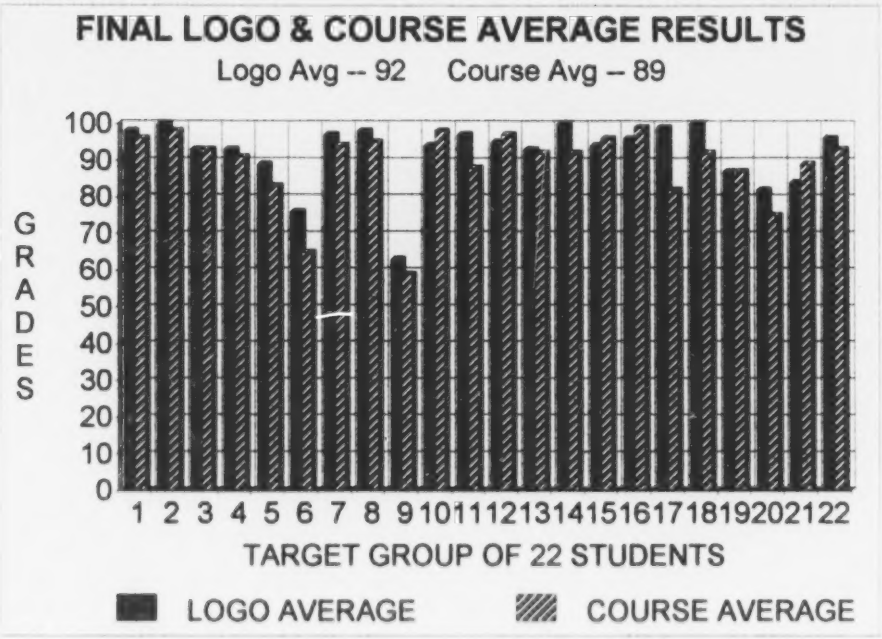
PRACTICAL COMPUTER SKILLS COURSE REPORT CARD

DIRECTIONS: This chart represents the targeted group's individual student course report card. A total passing/failing percentage is calculated.

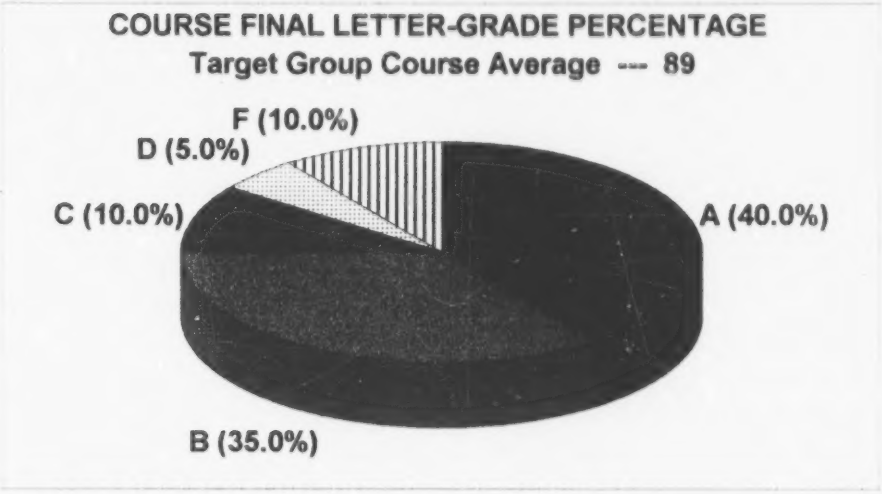
STUDENT	LOGO UNIT AVERAGE	COURSE GRADE
1	98 -- A	96 -- A
2	100 -- A	98 -- A
3	93 -- B	93 -- B
4	93 -- B	91 -- B
5	89 -- B	83 -- C
6	76 -- D	65 -- F
7	97 -- A	94 -- A
8	98 -- A	95 -- A
9	63 -- F	59 -- F
10	94 -- A	98 -- A
11	97 -- A	88 -- B
12	95 -- A	97 -- A
13	93 -- B	92 -- B
14	100 -- A	92 -- B
15	94 -- A	96 -- A
16	96 -- A	99 -- A
17	99 -- A	82 -- C
18	100 -- A	92 -- B
19	87 -- B	87 -- B
20	82 -- C	75 -- D
21	84 -- C	89 -- B
22	96 -- A	93 -- B

PERCENTAGE OF ***PASSING*** STUDENTS: **Logo 95 % Course 90 %**

PERCENTAGE OF ***FAILING*** STUDENTS: **Logo 5 % Course 10 %**



Target Group Logo/Course Grade Average Results



Practical Computer Skills: Logo Course Final Letter-Grade Average Percentage Results

APPENDIX: E

PRACTICAL COMPUTER SKILLS: LOGO PHILOSOPHY RESEARCH PAPER

RUBRIC SCALE

APPENDIX: E

PRACTICAL COMPUTER SKILLS: LOGO PHILOSOPHY RESEARCH PAPER RUBRIC SCALE

DIRECTIONS: This Rubric Scale is for scoring the final five page research paper.

Letter Grade	*Criteria*
"A"	The research paper must be complete (not less than five pages), thorough, and submitted on time. Knowledge of subject matter is clear. Topic is fully developed. Written work shows superior quality in verbal expression, attention to detail, and correct application of the convention of the English language. All citations and references are used correctly and consistently with clear efforts to follow requirements regarding form and style.
"B"	The research paper must be complete (not less than five pages), generally thorough. Knowledge of subject matter is clear and written work focuses on chosen topic. Student has made a clear effort to address all parts of paper, but might have missed on apart of one or two sections. Written work shows good quality in verbal expression, attention to detail, and correct application of the conventions of the English language. All work in the reference list are cited in the text. Student generally follow requirements regarding form and style.

"C" The research paper might be partially complete (approximately five pages). Knowledge of subject matter is not completely clear. Student does not address all parts of paper. Written work shows average quality in verbal expression, partial attention to detail, and nearly correct application of the conventions of the English language. An attempt to use citations and references was made, but may have made errors in format.

"D" The research paper is not complete, but something was submitted. Knowledge of subject matter is not clear. Student does not address many parts of paper. Written work shows below average quality in verbal expression, very little attention to detail, and errors in the conventions of English usage may interfere with the readability of the work. No attempt to use citations or references was made, and has made many errors in format.

'F" The research paper is not submitted.

APPENDIX: F

TEACHER DESIGNED PROGRAMS (WEEK 4)

APPENDIX: F

TEACHER DESIGNED PROGRAMS (WEEK 4)

EXHIBIT 1

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 1
Description : This is a drawing of a one-dimensional house to present, to the students, a beginning feel for Logo.

```
PU  BK 85  LT 90  FD 30  RT 90  PD

FD 80  RT 45  FD 50  RT 90  FD 50  RT 45  FD 80
RT 90  FD 70  BK 27.5  RT 90  FD 30  RT 90  FD 15
RT 90  FD 30

PU  BK 45  PD

BK 15  LT 90  FD 15  RT 90  FD 15  RT 90  FD 15

PU  FD 15  PD

FD 15  RT 90  FD 15  RT 90  FD 15  RT 90  FD 15
BK 7.5  LT 90  BK 15

PU  FD 30  PD

FD 15  RT 90

PU  FD 40  RT 90  FD 17  PD

FD 1  PU  FD 17  RT 90  FD 92  PD
```

```
FD 10   LT 90   FD 15   LT 90   FD 25   BK 25
LT 90   FD 7.5   LT 90
REPEAT 15 [LT 7 FD 5]
HT
```

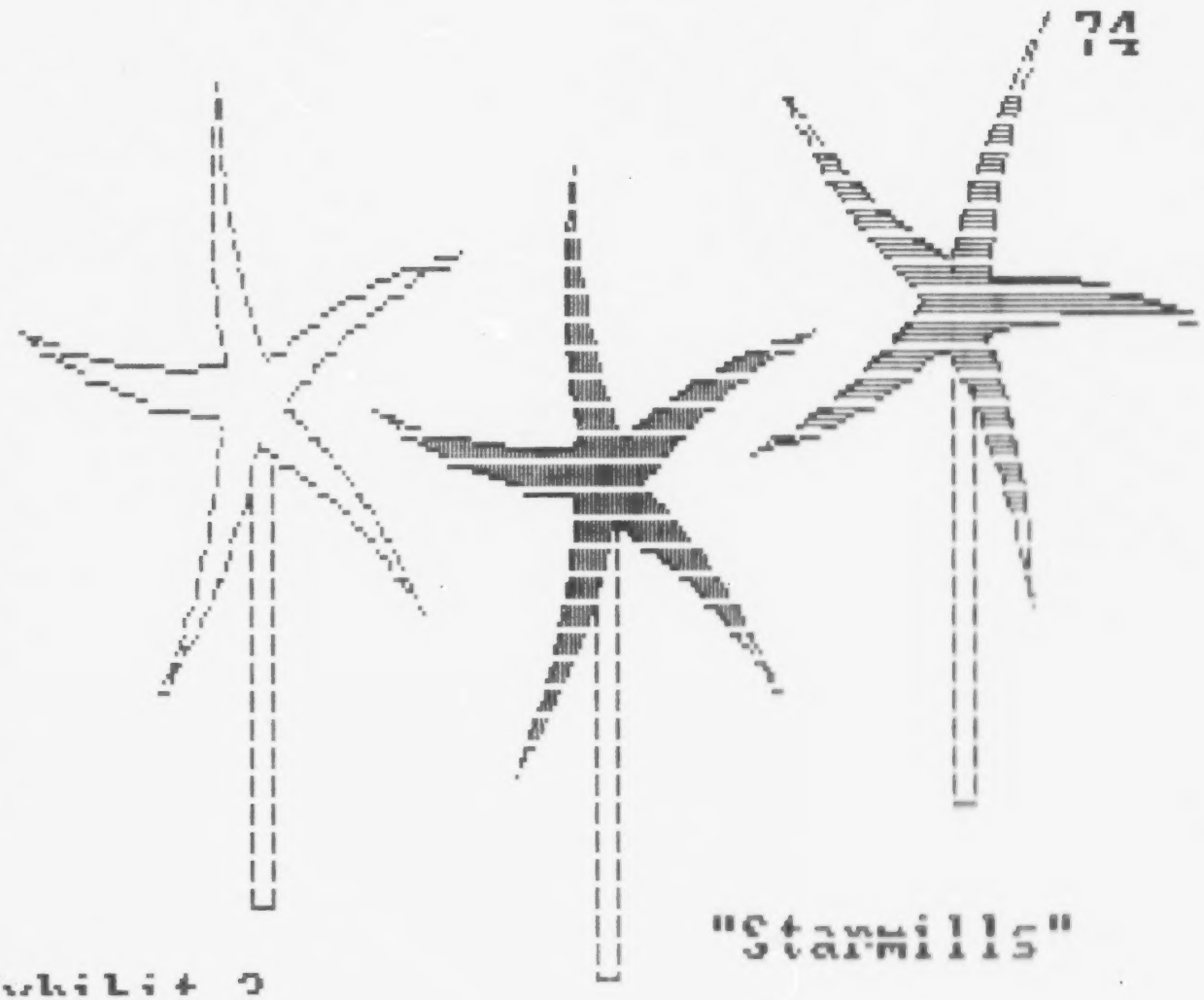
Exhibit 1

TEACHER DESIGNED PROGRAMS (WEEK 4)

EXHIBIT 2

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 2
Description : This is a drawing of "Starmills" that uses the REPEAT and LABEL commands.

```
PU   BK 2   LT 90   FD 15   RT 90   PD

LT 85   REPEAT 5 [REPEAT 25 [RT 1 FD 2]  RT 170
                  REPEAT 25 [LT 1 FD 2] LT 100]

PU   BK 5   SETC 2   PD   FILL   PU   RT 95   BK 13   SETC 1   PD
BK 72   RT 90   FD 5   LT 90   FD 80

PU  FD 20   LT 90   FD 95   RT 90   PD

LT 85   REPEAT 5 [REPEAT 25 [RT 1 FD 2]   RT 170
                  REPEAT 25 [LT 1 FD 2]   LT 100]

PU   BK 7   RT 95   BK 13   PD
BK 73   RT 90   FD 5   LT 90   FD 79   PU

RT 90   FD 160   LT 90   FD 20   LT 125   PD

REPEAT  5 [REPEAT 25 [RT 1 FD 2] RT 170
           REPEAT 25 [LT 1 FD 2]   LT 100]

PU   BK 5   SETC 3   PD   FILL   PU
RT 45   FD 3   RT 90   BK 8   SETC 1   PD

BK 75   RT 90   FD 5   LT 90   FD 73   PU   HT
```



"Starmills"

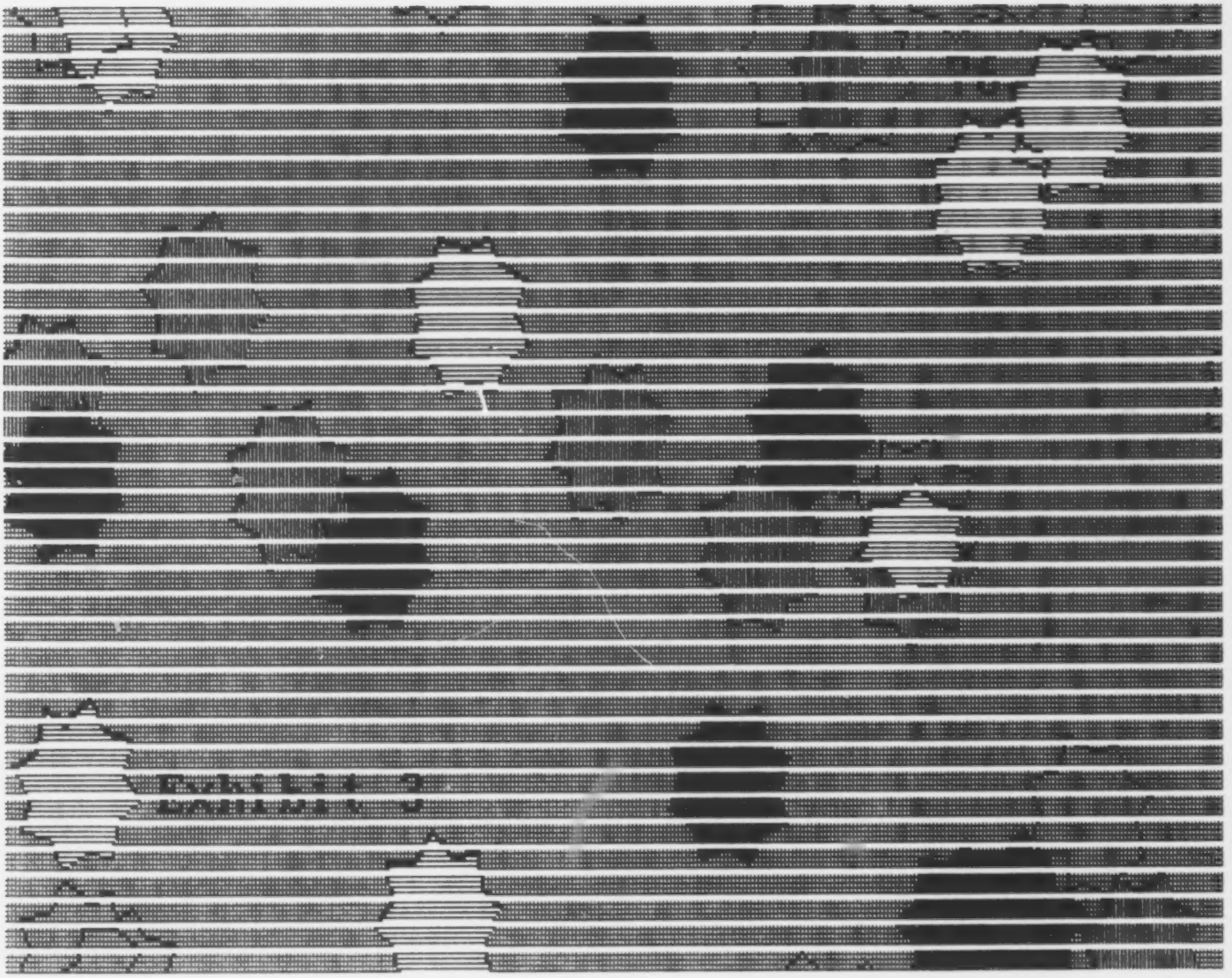
Exhibit 2

TEACHER DESIGNED PROGRAMS (WEEK 4)

EXHIBIT 3

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 3
Description : This is a drawing using RANDOM and COLOR (Back & Fore Ground) statements.

```
REPEAT 25
   [SETBG RANDOM 10
    SETC 1
    PU
    FD 80
    RT RANDOM 360
    FD RANDOM 90
    PD
    REPEAT 8 [RT 45  FD 7  RT 90  FD 7  LT 90]
    PU
    BK 5
    PD
    SETC RANDOM  4
    FILL]
```



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APPENDIX: G

TEACHER DESIGNED PROGRAMS (WEEK 5)

APPENDIX: G

TEACHER DESIGNED PROGRAMS (WEEK 5)

EXHIBIT 4

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 4
Description : This is a House Warming invitation using SHAPES that were provided by LogoWriter.

```
PU
BK 80
LT 90
FD 50
RT 90

REPEAT 4 [ REPEAT 4 [SETSH 20   PD   STAMP   PU   FD 20
                     SETSH 23   PD   STAMP   PU   FD 20]
           RT 90]

PU   FD 125   RT 90   FD 50   SETSH 20   PD

STAMP   PU
RT 90   FD 82   LT 90   BK 23   SETSH 27   PD
STAMP   PU

HT
```

Exhibit 4

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TEACHER DESIGNED PROGRAMS (WEEK 5)

EXHIBIT 5

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 5
Description : This is a Monster Bash Costume Dance invitation using new SHAPES that were created by the teacher.

```
PU
BK 80
LT 90
FD 50
RT 90

REPEAT 4 [ REPEAT 4 [ SETSH 1   PD   STAMP   PU   FD 20
                      SETSH 2   PD   STAMP   PU   FD 20]
           RT 90]

PU
FD 125
RT 90
FD 80
SETSH 4
PD
STAMP
PU
RT 90
FD 90
LT 90
BK 40
SETSH 1
PD
STAMP
PU
HT
```

01

MONSTER BASH
COSTUME DANCE

7pm Sat Nite

Carving
Contest

Exhibit 5

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TEACHER DESIGNED PROGRAMS (WEEK 5)

EXHIBIT 6

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 6
Description : This is a Castle scene that uses the FILL and SHADE primary commands.

```
PU
BK 60
LT 90
FD 107
RT 90
PD

REPEAT 10 [RT 90 FD 15 RT 90 FD 15 LT 90 FD 25 LT 90 FD 15]

PU  BK 18  LT 90  FD 12  RT 90  SETSH 29  SETC 3  PD

SHADE  PU  SETSH 0  SETC 1  FD 2.5  PD
FD 100
RT 90
FD 10
LT 90
FD 10

REPEAT 5 [FD 8 LT 90 FD 8 LT 90 FD 8 RT 90 FD 9 RT 90]

FD 8  LT 90  FD 8  LT 90  FD 8  FD 10  LT 90  FD 10
RT 90  FD 100  BK 100  LT 90  FD 75

PU  RT 90  BK 5  PD  SETC 2  FILL  SETC 1  PU

FD 30  RT 90  FD 23  PD  FD 5  LT 90  FD 25  LT 90  FD 5
LT 90  FD 25  PU  LT 90  FD 27.5  PD
```

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```
FD 5  LT 90  FD 25  LT 90  FD 5  LT 90  FD 25  PU  FD 5
SETC 2  SETSH 6  PD  SHADE  PU  SETSH 0  SETC 1  FD 30
LT 90  FD 25  RT 130  PD

FD 60  RT 100  FD 60  BK 60  LT 140  PU  BK 5  SETSH 30
PD  SHADE  PU  SETSH 0  FD 5  PD  FD 14  RT 105  FD 20
RT 155  FD 18  PU  LT 45  BK 5  SETC 3  PD  FILL  PU
LT 118  FD 130  SETSH 7  PD  STAMP  PU  HT
```

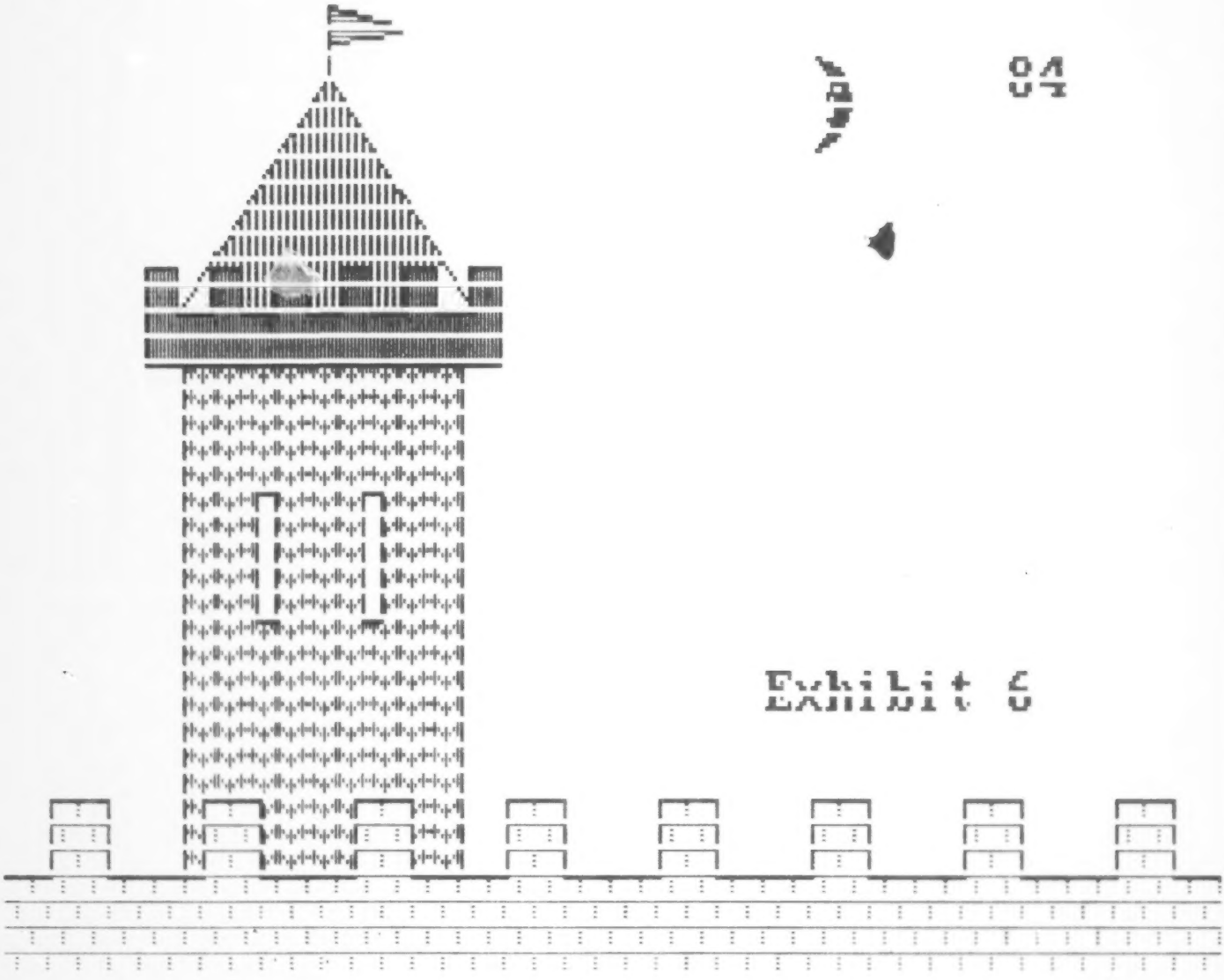

Exhibit 6

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APPENDIX: H

TEACHER DESIGNED PROGRAMS (WEEK 6)

APPENDIX: H

TEACHER DESIGNED PROGRAMS (WEEK 6)

EXHIBIT 7

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 7
Description : This is a BAR-B-QUE invitation using a PROCEDURE and three new SHAPES.

```
TO CARD
  PU
  BK 80
  LT 90
  FD 45
  RT 90
  REPEAT 4 [ REPEAT 3  [SETC 2  SETSH 31  PD  STAMP  PU
                        FD 25  SETC 1  SETSH 32  PD
                        STAMP  PU  FD 25]
             RT 90]

  PU  FD 60  RT 90  FD 120  SETC 3  SETSH 7  PD  STAMP
  PU  RT 90  FD 25  RT 90  FD 32  SETC 1  SETSH 32  PD
  STAMP  PU  FD 25  SETC 2  SETSH 31  PD  STAMP  PU
  HT
END
```

Exhibit 7

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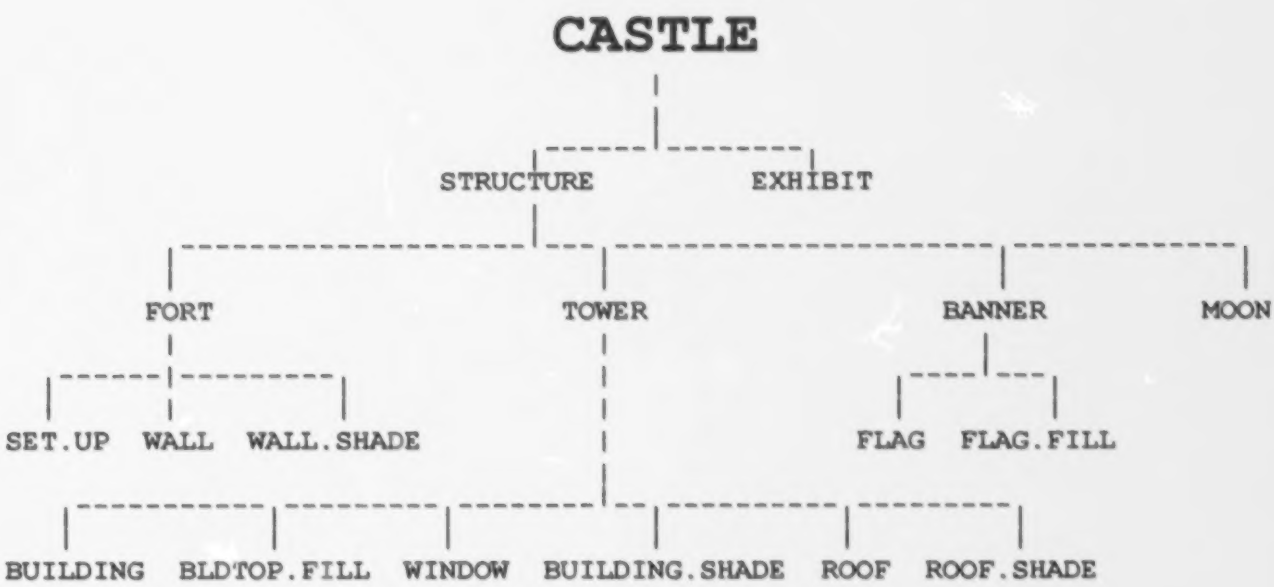
Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 8
Description : Procedure Tree.

PROCEDURE TREE
EXHIBIT 8



Description : This is a Castle scene that was used in exhibit 6. Now we will divide the code into PROCEDURES, which includes flashing LABEL.

```
TO CASTLE
  STRUCTURE
  EXHIBIT
END { CASTLE }


TO STRUCTURE
  FORT
  TOWER
  BANNER
  MOON
END { STRUCTURE }

TO FORT
  SET.UP
  WALL
  WALL.SHADE
END { FORT }

TO TOWER
  BUILDING
  BLDTOP.FILL
  WINDOW
  BUILD.SHADE
  ROOF
  ROOF.SHADE
END { TOWER }

TO BANNER
  FLAG
  FLAG.FILL
END { BANNER }

TO SET.UP
  PU  BK 60  LT 90  FD 107  RT 90  PD
END {SET.UP }
```

```
TO WALL
  REPEAT 10 [RT 90 FD 15 RT 90 FD 15 LT 90 FD 25 LT 90
             FD 15]
END { WALL }

TO WALL.SHADE
  PU BK 18 LT 90 FD 12 RT 90 SETSH 29 SETC 3 PD
  SHADE PU SETC 1
END { WALL.SHADE }

TO BUILDING
  FD 2.5 PD FD 100 RT 90 FD 10 LT 90 FD 10
  REPEAT 5 [FD 8 LT 90 FD 8 LT 90 FD 8 RT 90 FD 9 RT 90]
  FD 8 LT 90 FD 8 LT 90 FD 8 FD 10 LT 90 FD 10 RT 90
  FD 100
END { BUILDING }

TO BLDTOP.FILL
  BK 100 LT 90 FD 75 PU RT 90 BK 5 PD SETC 2 FILL
  SETC 1 PU
END { BLDTOP.FILL }

TO WINDOW
  FD 30 RT 90 FD 23 PD FD 5 LT 90 FD 25 LT 90 FD 5
  LT 90 FD 25 PU LT 90 FD 27.5 PD FD 5 LT 90 FD 25
  LT 90 FD 5 LT 90 FD 25
END { WINDOW }

TO BUILD.SHADE
  PU FD 5 SETC 2 SETSH 6 PD SHADE PU SETC 1
END { BUILD.SHADE }
```

```
TO ROOF
  FD 30  LT 90  FD 25  RT 130  PD  FD 60  RT 100  FD 60
END { ROOF }

TO ROOF.SHADE
  BK 60  LT 140  PU  BK 5  SETSH 30  PD  SHADE  PU  FD 5
END {ROOF.SHADE}

TO FLAG
  PD  FD 14  RT 105  FD 20  RT 155  FD 18  PU
END { FLAG }

TO FLAG.FILL
  LT 45  BK 5  SETC 3  PD  FILL  PU
END { FLAG.FILL }

TO MOON
  LT 118  FD 130  SETSH 7  PD  STAMP  PU  SETC 1
END { MOON }

TO EXHIBIT
  HT
  PU
  SETPOS [41.5 -40.5]
  REPEAT 9  [LABEL  [Exhibit 8]  WAIT 20]
END { EXHIBIT }
```

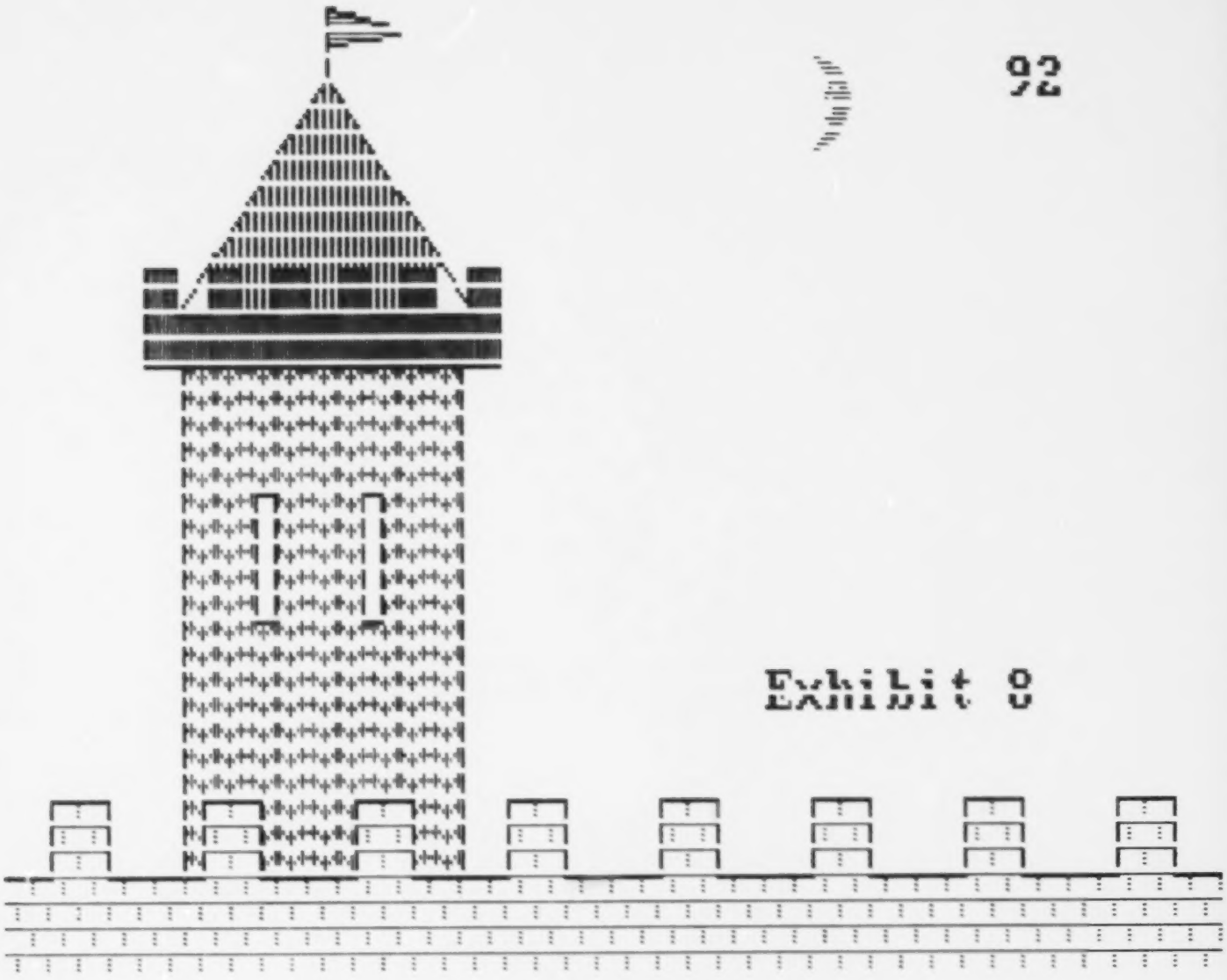


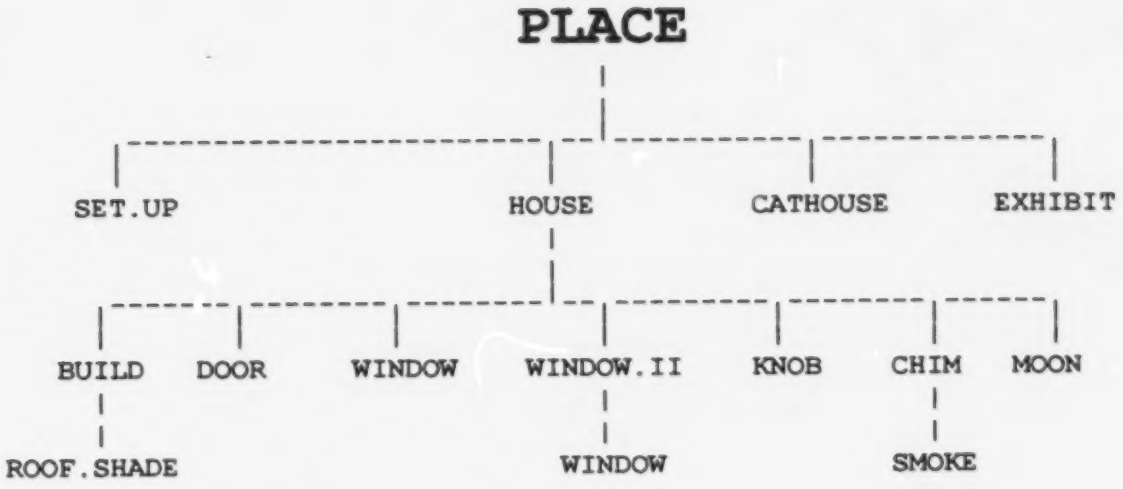
Exhibit 8

APPENDIX: I

TEACHER DESIGNED PROGRAMS (WEEK 7)

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 9
Description : Procedure Tree.

PROCEDURE TREE
EXHIBIT 9



Description : This is a drawing of a house from exhibit 1. In exhibit 9, PROCEDURES are added and a cat house.

```
TO PLACE
  SET.UP
  HOUSE
  CATHOUSE
  EXHIBIT
END {PLACE }


TO HOUSE
  BUILD
  DOOR
  WINDOW
  WINDOW.II
  KNOB
  CHIM
  MOON
END { HOUSE }

TO SET.UP
  PU  BK 85  LT 90  FD 30  RT 90
END { SET.UP }

TO BUILD
  PD  FD 80  RT 45  FD 50  RT 45  FD 100  RT 45  FD 50
  RT 45  FD 80  RT 90  FD 100  RT 90  FD 80  RT 90  FD 100
  LT 135  FD 50  LT 45  FD 100  LT 135  FD 50  RT 45
  ROOF.SHADE
END { BUILD }

TO ROOF.SHADE
  RT 35  PU  BK 10  SETSH 30  PD  SHADE  PU  FD 10
  LT 35  PD  FD 80  RT 90  FD 70
END { ROOF.SHADE }

TO DOOR
  BK 27.5  RT 90  FD 30  RT 90  FD 15  RT 90  FD 30  PU
  BK 45  PD
END { DOOR }
```

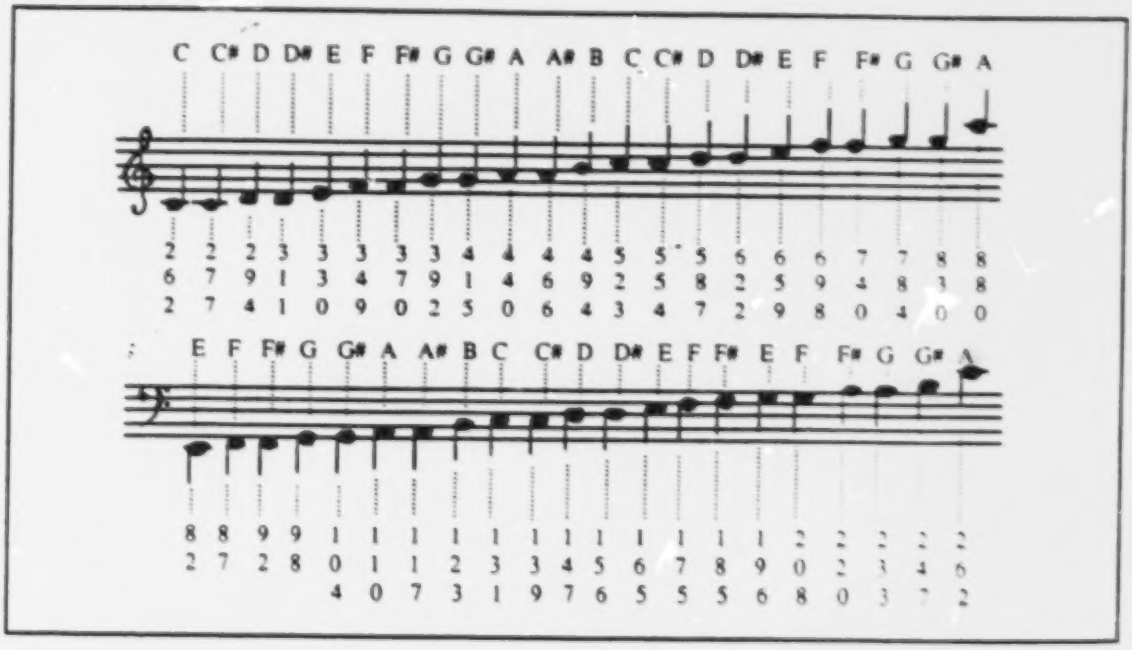
```
TO WINDOW
  BK 15  LT 90  FD 15  RT 90  FD 15  RT 90  FD 15  PU
  FD 15  PD  FD 15  RT 90  FD 15  RT 90  FD 15  RT 90
  FD 15  BK 7.5  LT 90  BK 15  PU  FD 30  PD  FD 15  PU
END { WINDOW }

TO WINDOW.II
  LT 90  FD 7.5  RT 90  FD 70  RT 90  FD 15  PD  WINDOW
END { WINDOW.II }

TO KNOB
  PU  BK 70  RT 90  FD 40  RT 90  FD 32  PD  FD 1  PU
END { KNOB }

TO CHIM
  FD 17  RT 90  FD 92  PD  FD 10  LT 90  FD 15  LT 90
  FD 25  BK 25  LT 90  FD 7.5  LT 90  PU  BK 10  SETC 3
  SETSH 29  PD  SHADE  PU  FD 10  SETC 1  SMOKE
END { CHIM }

TO SMOKE
  PD  REPEAT 15 [LT 7  FD 5]
END { SMOKE }

TO MOON
  PU  RT 15  BK 200  SETSH 7  PD  STAMP  PU  SETSH 0
END { MOON }

TO EXHIBIT
  PU  SETPOS [-153  91]  PRINT [ ]  PRINT [EXHIBIT 9]
END { EXHIBIT }

TO CATHOUSE
  SETPOS [-120  -85]  PD  RT 90  FD 20  RT 45  FD 20  RT 90
  FD 20  RT 45  FD 20  RT 90  FD 28  RT 90  FD 5  RT 90  PU
  FD 10  PD  REPEAT 4 [FD 8 LT 90]  PU  SETPOS [-135  -80]
  SETSH 21  PD  STAMP  HT
END { CATHOUSE }
```

EXHIBIT 9

APPENDIX: J

HANDOUT - MUSIC NOTES AND DURATIONS

Note	Name	Dur
♪	Eighth note	2.5
♩	Quarter note	5
♩.	Dotted quarter note	7.5
𝅗𝅥	Half note	10
𝅗𝅥.	Dotted half note	15



Notes

Octave	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
1			37	39	41	44	46	49	52	55	58	62
2	65	69	73	78	82	87	92	98	104	110	117	123
3	131	139	147	156	165	175	185	196	208	220	233	247
4	*262	277	294	311	330	349	370	392	415	440	466	494
5	523	554	587	622	659	698	740	784	830	881	932	988
6	1047	1109	1176	1244	1319	1398	1480	1566	1668	1761	1864	1973
7	2095	2213	2346	2495	2637	2797	2959	3142	3327	3510	3743	3946

* This is Middle C

APPENDIX: K

TEACHER DESIGNED PROGRAMS (WEEK 8)

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 10
Description : Procedure Tree.

PROCEDURE TREE
EXHIBIT 10

Description : This program is an exercise of using MUSIC in a PROCEDURE. We will use Twinkle Twinkle Little Star for the song.

```
TO TWINKLE
  STAR
  MOON
  SONG
  EXHIBIT
END { TWINKLE }


TO STAR
  SETSH 10  REPEAT 35  [PU  RT  RANDOM 360  FD
                        RANDOM 200 PD  STAMP]
END { STAR }

TO MOON
  PU  SETPOS [95 60]  SETSH 7  PD  STAMP  PU
END { MOON }

TO EXHIBIT
  PU  SETPOS [-150  85]  PD  PRINT [ ]  PRINT [EXHIBIT 10]
  PU  HT
END { EXHIBIT }

TO SONG
  ONE.VERSE
  TWO.VERSE
  ONE.VERSE
END { SONG }

TO ONE.VERSE
  TONE 262 5  TONE 262 5  TONE 392 5  TONE 392 5
  TONE 440 5  TONE 440 5  TONE 392 10  TONE 349 5
  TONE 349 5  TONE 330 5  TONE 330 5  TONE 294 5
  TONE 294 5  TONE 262 10
END { ONE.VERSE }
```

```
TO TWO.VERSE
   TONE 392 5   TONE 392 5   TONE 349 5   TONE 349 5
   TONE 330 5   TONE 330 5   TONE 294 10   TONE 392 5
   TONE 392 5   TONE 349 5   TONE 349 5   TONE 330 5
   TONE 330 5   TONE 294 10
END { TWO.VERSE }
```

EXHIBIT 10

104

APPENDIX: L

TEACHER DESIGNED PROGRAMS (WEEK 9)

APPENDIX: L

TEACHER DESIGNED PROGRAMS (WEEK 9)

EXHIBIT 11

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 11
Description : This is a poem about Trees, to be introduced to using TEXT.

```
PU
HT

Trees
by Joyce Kilmer

I think that I shall never see
A poem lovely as a tree.

A tree whose hungry mouth is prest
Against the earth's sweet flowing breast;

A tree that looks at God all day,
And lifts her leafy arms to pray;

A tree that in summer wear
A nest of robins in her hair;

Upon whose bosom has lain;
Who intimately lives with rain.
```

Poems are made by fools like me,
But only God can make a tree.

TREE
TREETREE
TREETREETREE
TREETREETREETREE
TREETREETREETREETREE
TREE
TREE

Exhibit 11

Trees
by Joyce Kilmer

I think that I shall never see
A poem lovely as a tree.

A tree whose hungry mouth is prest
Against the earth's sweet flowing breast;

A tree that looks at God all day,
And lifts her leafy arms to pray;

A tree that in summer wear
A nest of robins in her hair;

Upon whose bosom has lain;
Who intimately lives with rain.

Poems are made by fools like me,
But only God can make a tree.

TREE
TREETREE
TREETREETREE
TREETREETREETREE
TREETREETREETREETREE
TREE
TREE

TEACHER DESIGNED PROGRAMS (WEEK 9)

EXHIBIT 12

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 12
Description : This is a Quilting Poster that mixes TEXT and Graphics.

```
PU  BK 70  LT 90  FD 80  RT 90  PD

REPEAT 2 [FD 70 RT 90 FD 130 RT 90]

FD 46.66  RT 90  FD 130  RT 90  FD 23.33  RT 90  FD 130
RT 90  BK 23.33  RT 90  FD 43.33  LT 90  FD 70  RT 90
FD 43.33  RT 90  FD 70  LT 90  FD 21.67

PU  LT 90  FD 11.67  SETSH 8  PD  SETC 2  SHADE
PU  FD 23.33  SETC 1  SETSH 9  PD  SHADE
PU  FD 23.33  SETC 3  SETSH 6  PD  SHADE
PU  LT 90  FD 43.33  LT 90  SETC 1  SETSH 9
PD  SHADE  PU  FD 23.33  PD  FILL  SETC 2
SETSH 31  STAMP  PU  FD 23.33  SETC 1  SETSH 9
PD  SHADE  PU  RT 90  FD 43.33  RT 90  SETC 3
SETSH 6  PD  SHADE  PU  FD 23.33  SETC 1
SETSH 9  PD  SHADE  PU  FD 23.33  SETC 2
SETSH 8  PD  SHADE  PU  HT
```

QUILTING BEE

Quilters are SEW special.
Come and SEW with us -- Sat 7pm

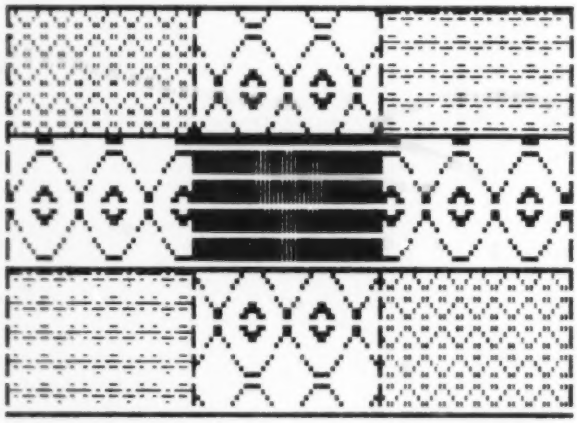
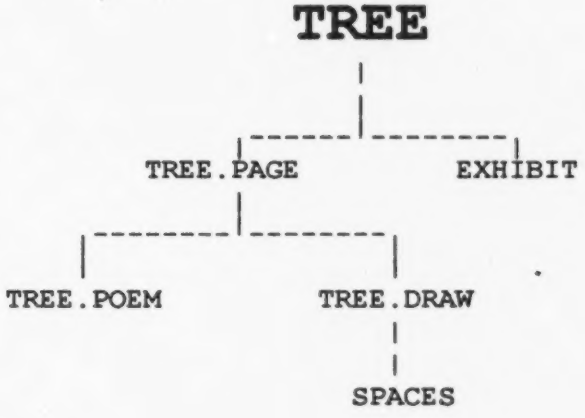


EXHIBIT 12

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 13
Description : Procedure Tree.

PROCEDURE TREE
EXHIBIT 13



Description : *This is a poem about Trees used in Exhibit 11. Now we* will use the PRINT statement within a PROCEDURE to present the poem in this easier form.

```
TO TREE
   EXHIBIT
   TREE.PAGE
END { TREE }

TO TREE.PAGE
   TREE.POEM
   TREE.DRAW
END { TREE.PAGE }

TO TREE.POEM
   PRINT [Trees]
   PRINT [by Joyce Kilmer]   PRINT [ ]
   PRINT [I think that I shall never see]
   PRINT [a poem lovely as a tree.]   PRINT [ ]
   PRINT [A tree whose hungry mouth is prest]
   PRINT [Against the earth's sweet flowing breast;]
   PRINT []   PRINT [A tree that look at God all day,]
   PRINT [And lifts her leafy arms to pray;]   PRINT [ ]
   PRINT [A tree that may in Summer wear]
   PRINT [A nest of robins in her hair;]   PRINT [ ]
   PRINT [Upon whose bosom snow has  lain;]
   PRINT [Who intimately lives in rain.]  PRINT [ ]
   PRINT [Poems are made by fools like me,]
   PRINT [But only God can make a tree.]
END { TREE.POEM }

TO SPACES :NUMBER
   REPEAT :NUMBER  [INSERT CHAR 32]
END { SPACES }

TO TREE.DRAW
   PRINT [ ]   PRINT [ ]   SPACES 15   PRINT [TT]   PRINT [ ]
   SPACES 14   INSERT "R   SPACES 2   INSERT "R
   PRINT [ ]   PRINT [ ]
   SPACES 13   INSERT "E   SPACES 4   INSERT "E
   PRINT [ ]   PRINT [ ]
   SPACES 12   INSERT "E   SPACES 6   INSERT "E
```

```
  PRINT [ ]  PRINT [ ]
  SPACES 11   INSERT "S   SPACES 8   INSERT "S
  PRINT [ ]  PRINT [ ]
  SPACES 10   PRINT [TREETREETREE]
  SPACES 14   PRINT [TREE]
  SPACES 14   PRINT [TREE]   SPACES 14   PRINT [TREE]
END { TREE.DRAW }

TO EXHIBIT
  PRINT [ ]   PRINT [ ]   PRINT [ ]   PRINT [Exhibit 13]
  PRINT [ ] PRINT [ ]
END { EXHIBIT }
```

Exhibit 13

Trees
by Joyce Kilmer

I think that I shall never see
A poem lovely as a tree.

A tree whose hungry mouth is prest
Against the earth's sweet flowing breast;

A tree that looks at God all day,
And lifts her leafy arms to pray;

A tree that in summer wear
A nest of robins in her hair;

Upon whose bosom has lain;
Who intimately lives with rain.

Poems are made by fools like me,
But only God can make a tree.

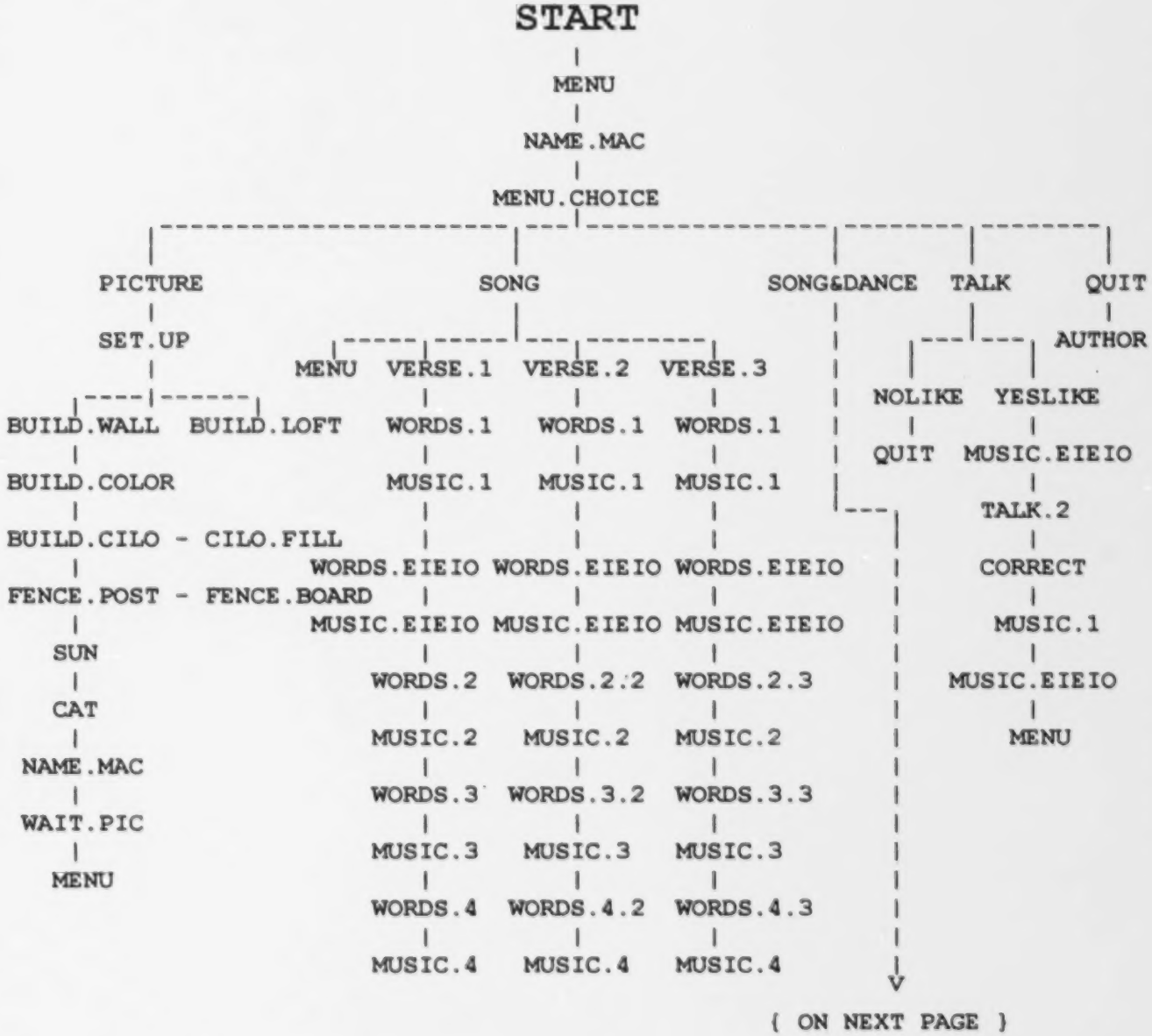
TREE
TREETREE
TREETREETREE
TREETREETREETREE
TREETREETREETREETREE
TREE
TREE

APPENDIX: M

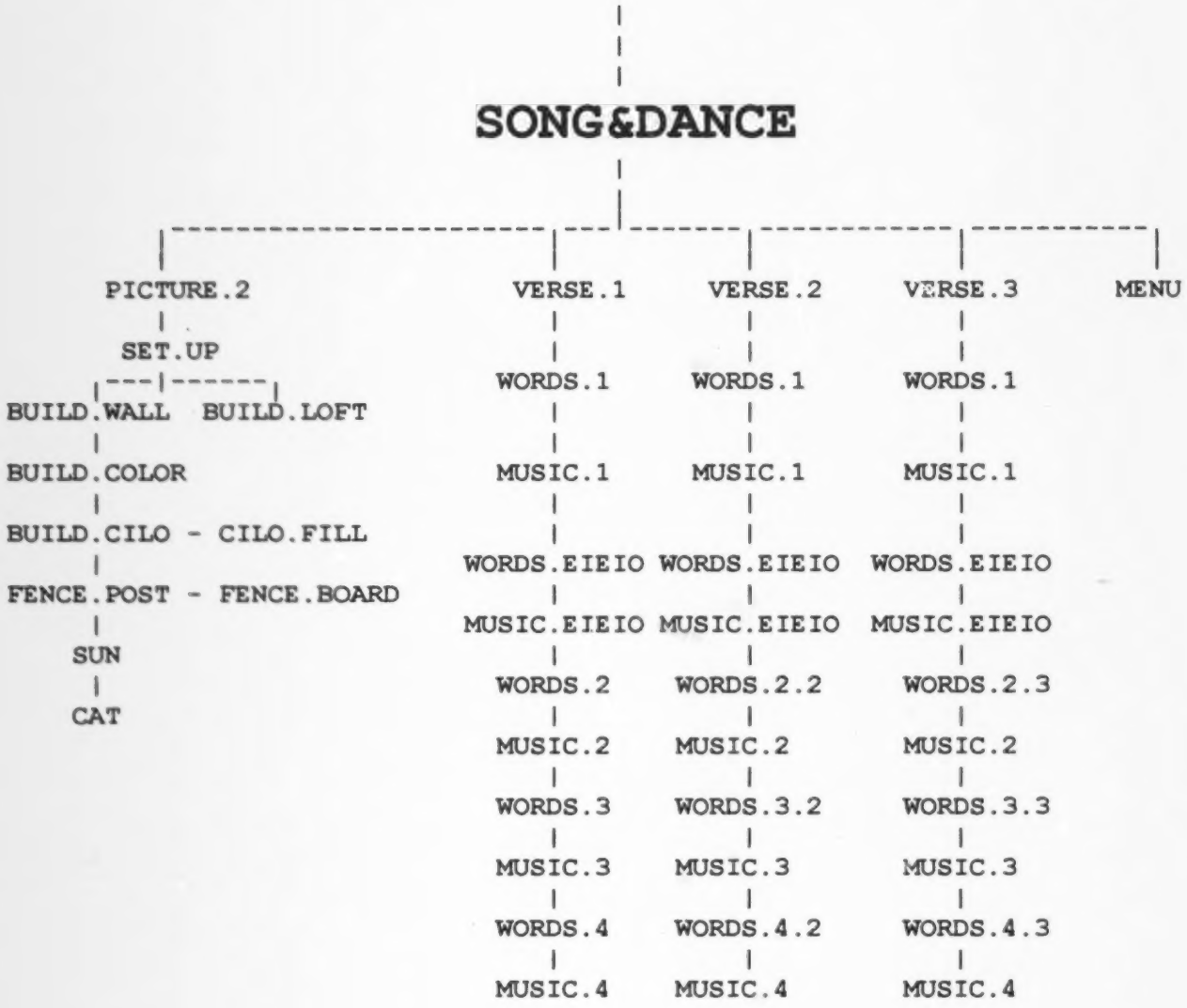
TEACHER DESIGNED PROGRAMS (WEEK 10)

Teacher : Douglas S. Miller
Class : Practical Computer Skills
Author : Douglas S. Miller
Assignment : Exhibit 14 -- Final Project
Description : Procedure Tree.

PROCEDURE TREE
EXHIBIT 14 -- FINAL PROJECT



{ ON NEXT PAGE }



** SPACES and READWORD procedures were used throughout the program.

Description : This Final Program, Exhibit 14, uses all the skills learned to this point and maybe a few more advanced commands. The theme of this PROJECT is: Old MacDonald's Farm.

```
TO START
  MENU
END { START }

TO MENU
  RG  HT  CT   NAME.MAC   PRINT [Would you like to ...]  PRINT [ ]
  SPACES 3   PRINT [1. See the FARM.]
  SPACES 3   PRINT [2. Play the SONG.]
  SPACES 3   PRINT [3. SEE and HEAR.]
  SPACES 3   PRINT [4. TALK to the COMPUTER.]
  SPACES 3   PRINT [5. EXIT the Program.]  PRINT [ ]
  INSERT [Your Choice:]  SPACES 1
  MENU.CHOICE   READWORD
END { MENU }

TO MENU.CHOICE  :PICK
  IF :PICK = 1 [PICTURE]
  IF :PICK = 2 [SONG]
  IF :PICK = 3 [SONG&DANCE]
  IF :PICK = 4 [TALK]
  IF :PICK = 5 [QUIT]
  IF OR (:PICK < 1) (:PICK > 5)  [MENU]
END { MENU.CHOICE }

TO PICTURE
  CT   RG
  SET.UP
  BUILD.WALL
  BUILD.COLOR
  BUILD.CILO
  FENCE.POST
  SUN
  CAT
  NAME.MAC
  WAIT.PIC
  MENU
END { PICTURE }
```

```
TO SET.UP
  PU   BK 90   LT 90   FD 30   RT 90
END { SET.UP }

TO BUILD.WALL
  PD   FD 70   RT 45   FD 45   RT 45   FD 60   RT 45   FD 45
  RT 45   FD 70   RT 90   FD 30   RT 90   FD 40
  BUILD.LOFT   FD 62   LT 90   FD 40   RT 90   FD 30   PU
END { BUILD.WALL }

TO BUILD.COLOR
  PU   BK 10   LT 90   BK 10   SETSH 33   SETC 2   PD
  SHADE   SETSH 0   SETC 1   PU   FD 10   RT 90   FD 10
END { BUILD.COLOR }

TO BUILD.LOFT
  PU   FD 20   LT 90   FD 11   RT 90   PD   FD 25   LT 90
  FD 40   LT 90 FD 25 LT 90 FD 40 LT 150 FD 46 LT 120
  FD 24   LT 121   FD 46   PU   LT 149   FD 20   LT 90   PD
  FD 24   LT 90   FD 20   RT 90   PU   FD 20   RT 90   BK 11
  PD
END { BUILD. LOFT }

TO BUILD.CILO
  FD 1   PD   RT 90   FD 110   LT 45   FD 25   LT 45   FD 20
  LT 45   FD 25   LT 45   FD 110   LT 90   FD 55   CILO.FILL
END { BUILD.CILO }

TO CILO.FILL
  PU   BK 10   RT 90   BK 10   PD   SETC 3   SETSH 30
  SHADE   SETC 1   PU   FD 10   RT 90   FD 45   SETSH 0
END { CILO.FILL }

TO FENCE.POST
  PU   FD 25
  REPEAT 4  [RT 90  PD  FD 25  LT 90  FD 5  LT 90  FD 25
             LT 90  FD 5  PU  RT 180  FD 30  PD]
  FENCE.BOARD
END { FENCE.POST }
```

```
TO FENCE.BOARD
  PU
  REPEAT 2 [RT 90 FD 5]
  PD  FD 140  LT 90  FD 9  LT 90  FD 141  RT 90  FD 9
  RT 90  FD 141  PU
END { FENCE.BOARD }

TO SUN
  PU  SETPOS [118 25]  PD
  REPEAT 25 [LT 90 FD 8 BK 8 RT 90
                REPEAT 12 [FD .5 RT 1.5] ]
END { SUN }

TO CAT
  PU  SETPOS [15.5 -84]  SETSH 21  PD  STAMP  HT  PU
END { CAT }

TO NAME.MAC
  SETC 1  PRINT [ ]  PRINT [ ]  SPACES 10
  PRINT [Old MacDonald's Farm]  PRINT [ ]  PRINT [ ]
END { NAME.MAC }

TO SONG
  VERSE.1
  VERSE.2
  VERSE.3
  MENU
END { SONG }

TO VERSE.1
  CT  HT  PRINT [ ]  PRINT [ ]  SPACES 12
  PRINT [Old MacDonald]  WAIT 50  CT  WORDS.1  MUSIC.1
  CT  WORDS.EIEIO  MUSIC.EIEIO  CT  WORDS.2  MUSIC.2
  CT  WORDS.EIEIO  MUSIC.EIEIO  CT  WORDS.3  MUSIC.3
  CT  WORDS.4  MUSIC.1  CT  WORDS.1  MUSIC.1
  CT  WORDS.EIEIO  MUSIC.EIEIO  WAIT 20
END { VERSE.1 }
```

```
TO VERSE.2
  CT  WORDS.1  MUSIC.1  CT  WORDS.EIEIO  MUSIC.EIEIO
  CT  WORDS.2.2  MUSIC.2  CT  WORDS.EIEIO  MUSIC.EIEIO
  CT  WORDS.3.2  MUSIC.3  CT  WORDS.4.2  MUSIC.4
  CT  WORDS.1  MUSIC.1  CT  WORDS.EIEIO  MUSIC.EIEIO
  WAIT 20
END { VERSE.2 }

TO VERSE.3
  CT  WORDS.1  MUSIC.1  CT  WORDS.EIEIO  MUSIC.EIEIO
  CT  WORDS.2.3  MUSIC.2  CT  WORDS.EIEIO  MUSIC.EIEIO
  CT  WORDS.3.3  MUSIC.3  CT  WORDS.4.3  MUSIC.4
  CT  WORDS.1  MUSIC.1  CT  WORDS.EIEIO MUSIC.EIEIO
WAIT 50END { VERSE.3 }

TO WORDS.1
  PRINT [ ]  PRINT [ ]  SPACES 7
  PRINT [Old MacDonald had a farm,]
END { WORDS.1 }

TO MUSIC.1
  REPEAT 3 [TONE 392 5 TONE 000 1]  TONE 294 5
  REPEAT 2 [TONE 330 5 TONE 000 1]  TONE 294 10
END { MUSIC.1 }

TO WORDS.EIEIO
  PRINT [ ]  PRINT [ ]  SPACES 11  SETTC 2
  PRINT [E - I - E - I - O]  SETTC 1
END { WORDS.EIEIO }

TO MUSIC.EIEIO
  REPEAT 2 [TONE 494 5 TONE 000 1]
  REPEAT 2 [TONE 440 5 TONE 000 1]
  TONE 392 10  TONE 000 5
END { MUSIC.EIEIO }

TO WORDS.2
  PRINT [ ]  PRINT [ ]  SPACES 4
  INSERT [And on his farm he had some]  SPACES 1  SETTC 3
  INSERT [COWS]  SETTC 1  PRINT [.]
END { WORDS.2 }
```

```
TO WORDS.2.2
  PRINT [ ]  PRINT [ ]  SPACES 3
  INSERT [And on his farm he had some]  SPACES 1  SETTC 3
  INSERT [DUCKS]  SETTC 1  PRINT [,]
END { WORDS.2.2 }

TO WORDS.2.3
  PRINT [ ]  PRINT [ ]  SPACES 5
  INSERT [And on his farm he had a]  SPACES 1  SETTC 3
  INSERT [CAT]  SETTC 1  PRINT [,]
END { WORDS.2.3 }

TO MUSIC.2
  TONE 294 5  MUSIC.1
END { MUSIC.2 }

TO WORDS.3
  PRINT [ ]  PRINT [ ]  SPACES 10
  INSERT [With a]  SPACES 1  SETTC 3  INSERT [MOO-MOO]
  SPACES 1  SETTC 1  PRINT [here]  SPACES 10
  INSERT [and a]  SPACES 1  SETTC 3  INSERT [MOO-MOO]
  SPACES 1  SETTC 1  PRINT [there,]
END { WORDS.3 }

TO WORDS.3.2
  PRINT [ ]  PRINT [ ]  SPACES 8  INSERT [With a]
  SPACES 1  SETTC 3  INSERT [QUACK-QUACK]  SPACES 1
  SETTC 1  PRINT [here]  SPACES 8  INSERT [and a]  SPACES 1
  SETTC 3  INSERT [QUACK-QUACK]  SPACES 1  SETTC 1
  PRINT [there,]
END { WORS.3.2 }

TO WORDS.3.3
  PRINT [ ]  PRINT [ ]  SPACES 9  INSERT [With a]  SPACES 1
  SETTC 3  INSERT [MEOW-MEOW]  SPACES 1  SETTC 1
  PRINT [here]  SPACES 9  INSERT [and a]  SPACES 1  SETTC 3
  INSERT [MEOW-MEOW]  SPACES 1  SETTC 1  PRINT [there,]
END { WORDS.3.4 }
```

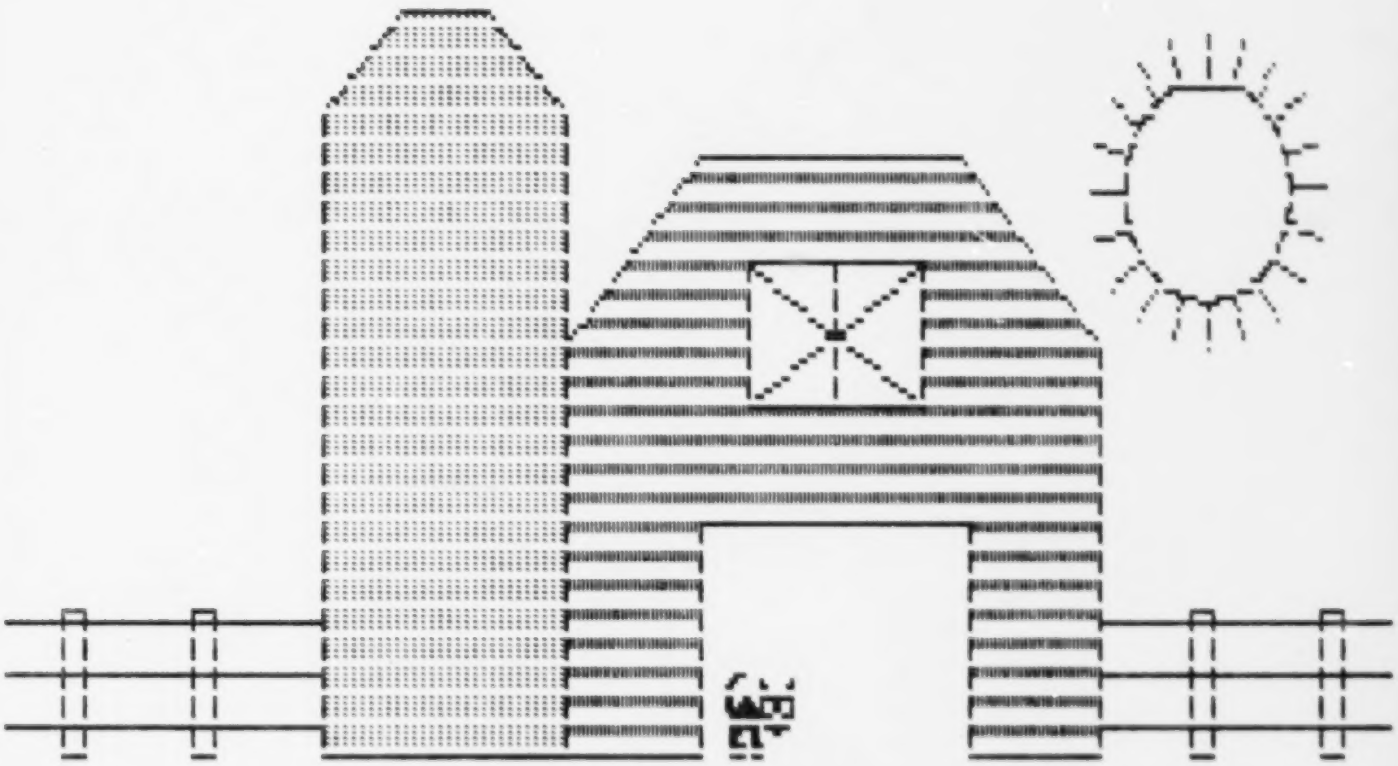
```
TO MUSIC.3
  REPEAT 2 [TONE 294 2  TONE 000 1]
  REPEAT 3 [TONE 392 5  TONE 000 1]
  REPEAT 2 [TONE 294 2  TONE 000 1]
  REPEAT 2 [TONE 392 5  TONE 000 1]
  TONE 392 10
END { MUSIC.3 }

TO WORDS.4
  PRINT [ ]  PRINT [ ]  SPACES 7  INSERT [Here a]  SPACES 1
  SETTC 3  INSERT [MOO]  SETTC 1  INSERT [, there a]
  SPACES 1  SETTC 3  INSERT [MOO]  SETTC 1  PRINT [.]
  SPACES 8  INSERT [everywhere a]  SPACES 1  SETTC 3
  INSERT [MOO-MOO]  SETTC 1  PRINT [.]
END { WORDS.4 }

TO WORDS.4.2
  PRINT [ ]  PRINT [ ]  SPACES 5  INSERT [Here a]  SPACES 1
  SETTC 3  INSERT [QUACK]  SETTC 1  INSERT [, there a]
  SPACES 1  SETTC 3  INSERT [QUACK]  SETTC 1  PRINT [.]
  SPACES 6  INSERT [everywhere a]  SPACES 1  SETTC 3
  INSERT [QUACK-QUACK]  SETTC 1  PRINT [.]
END { WORDS.4.2 }

TO WORDS.4.3
  PRINT [ ]  PRINT [ ]  SPACES 6  INSERT [Here a]  SPACES 1
  SETTC 3  INSERT [MEOW]  SETTC 1  INSERT [, there a]
  SPACES 1  SETTC 3  INSERT [MEOW]  SETTC 1  PRINT [.]
  SPACES 7  INSERT [everywhere a]  SPACES 1  SETTC 3
  INSERT [MEOW-MEOW]  SETTC 1  PRINT [.]
END { WORDS.4.3 }

TO MUSIC.4
  REPEAT 2 [REPEAT 2 [TONE 392 2 TONE 000 1]
              TONE 392 5  TONE 000 1]
  REPEAT 4 [TONE 392 2 TONE 000 1]
  REPEAT 2 [TONE 392 5 TONE 000 1]
END { MUSIC.4 }
```

```
TO PICTURE.2
  CT  RG
  SET.UP
  BUILD.WALL
  BUILD.COLOR
  BUILD.CILO
  FENCE.POST
  SUN
  CAT
END { PICTURE.2 }

TO SONG&DANCE
  PICTURE.2
  VERSE.1
  VERSE.2
  VERSE.3
  MENU
END { SONG&DANCE }

TO WAIT.PIC
  WAIT 200
END { WAIT.PIC }

TO QUIT
  CT  PRINT [ ]  PRINT [ ]  SPACES 3
  PRINT [This is the end of our Program !!]  PRINT [ ]  PRINT [ ]
  SPACES 11  PRINT [See Ya Next Time.]  PRINT [ ]  WAIT 60
  AUTHOR
END { QUIT }

TO READWORD
  OUTPUT  FIRST  READLIST
END { READWORD }

TO SPACES :NUMBER
  REPEAT :NUMBER [INSERT CHAR 32]
END { SPACES }

TO AUTHOR
  SETTC 1  CT  REPEAT 4 [PRINT [ ]]  SPACES 6
  PRINT [This Program was designed by:]  PRINT [ ]  SPACES 12
  PRINT [Douglas S. Miller]  PRINT [ ]  PRINT [ ]
END { AUTHOR }
```

```
TO TALK
  CT  HT  PRINT [ ]  PRINT [Hello -- I'm MOE the       computer.]
  PRINT [ ]  INSERT [WHO are you ?]  PRINT [ ]  PRINT [ ]
  (PRINT [Hello ] READLIST)  PRINT [ ]  PRINT [ ]  PRINT [ ]
  PRINT [Did you like our SHOW of:]  PRINT [ ]  SPACES 10
  SETTC 3  INSERT [Old MacDonald's Farm]  SETTC 1  SPACES 1
  PRINT [?]  PRINT [ ]  PRINT [ ]  PRINT [ ]
  INSERT [What do ya say (Y OR N):]  SPACES 1
  IFELSE READCHAR = "Y  [YESLIKE]  [NOLIKE]
END { TALK }

TO NOLIKE
  CT  PRINT [ ]  PRINT [ ]  PRINT [OH, So SORRY !!]  PRINT [ ]
  PRINT [ ]  PRINT [Maybe we will have another SHOW later]
  PRINT [that you will like more.]  TONE 60 20  TONE 40 30
  WAIT 10  QUIT
END { NOLIKE }

TO YESLIKE
  CT  PRINT [ ]  PRINT [ ]  PRINT [ ]  PRINT [ ]  SETTC 3
  SPACES 3  INSERT [HAPPY !!]  SPACES 5  SETTC 2
  INSERT [HAPPY !!]  SPACES 5  SETTC 3  INSERT [HAPPY !!]
  SETTC 1  PRINT [ ]  PRINT [ ]  PRINT [ ]  PRINT [ ]  SPACES 5
  PRINT [I'M REALLY GLAD YOU LIKED IT       !!]  PRINT [ ]
  SPACES 12  PRINT [MOE is PLEASED!!!]  PRINT [ ]  PRINT [ ]
  MUSIC.EIEIO  WAIT 80  TALK.2
END { YESLIKE }

TO TALK.2
  CT  PRINT [ ]  PRINT [ ]  PRINT [OK....]  PRINT [ ]  PRINT [ ]
  PRINT [Now, let MOE see if you have done]
  PRINT [your HOMEWORK ?]  PRINT [ ]  PRINT [ ]  PRINT [ ]
  PRINT [Enter the number of verses of the]
  PRINT [SONG that we SANG ?]  PRINT [ ]  PRINT [ ]  PRINT [ ]
  INSERT [YOU GUESS (1-3) ?]  SPACES 1
  IF ELSE READCHAR = 3  [CORRECT]  [TONE 40 20  TALK.2]
END { TALK.2 }
```

```
TO CORRECT
  CT  PRINT [ ]  PRINT [ ]  PRINT [ ]  PRINT [ ]  SETTC 3
  SPACES 14  PRINT [CORRECT !!!]  SETTC 1  PRINT [ ]
  PRINT [ ]  PRINT [ ]  SPACES 3
  PRINT [You guessed the correct number !!]  PRINT [ ]  PRINT [ ]
  SPACES 5  PRINT [MOE is VERY, VERY PLEASED !!!]  PRINT [ ]
  PRINT [ ]  PRINT [ ]  MUSIC.1  MUSIC.EIEIO  WAIT 70  MENU
END {CORRECT }
```

Old MacDonald's Farm



APPENDIX: N

TEACHER DESIGNED 50 QUESTION FINAL EXAM

APPENDIX: N

PRACTICAL COMPUTER SKILLS
TEST -- Logo Programming Language

NAME: _____ PERIOD: _____

PART 1 -- Matching

DIRECTIONS: Place the corresponding LETTER with the matching symbol. (2 points each)

1)	NP "	_____	A.	Make Directory
2)	FD	_____	B.	Back
3)	LT	_____	C.	Cleargraphic
4)	BK	_____	D.	Show Turtle
5)	PU	_____	E.	Pen Erase
6)	PD	_____	F.	Namepage
7)	HT	_____	G.	Left
8)	ST	_____	H.	Pen Down
9)	CG	_____	I.	Hide Turtle
10)	CT	_____	J.	Right
11)	PE	_____	K.	Pen Up
12)	RT	_____	L.	Forward
13)	MKDIR	_____	M.	Cleartext

PART 2 -- Multiple Choice

DIRECTIONS: Place the corresponding letter in the space provided. (2 points each)

14. ____ What will this draw: Repeat 4 [FD 50 RT 90]

A) circle
B) triangle
C) rectangle
D) square

15. ____ What will this draw: Repeat 360 [FD 1 RT 1]

A) circle
B) triangle
C) rectangle
D) square

16. ____ What will this draw: Repeat 3 [FD 40 RT 120]

A) circle
B) triangle
C) rectangle
D) square

17. ____ Which Function Key is used to put a Label on the screen ?

A) F6
B) F7
C) F8
D) F9

18. ____ Which Function Key is used to move the turtle on the screen ?

A) F6
B) F7
C) F8
D) F9

19. ____ How is the Background Color changed to Blue if the corresponding number is 5 ?

A) Setsh 5
B) Setc 5
C) Setbg 5
D) None Of The Above

20. ____ How is the color of the turtle changed to green if the corresponding number is 2 ?

A) Setsh 2
B) Setc 2
C) Setbg 2
D) None Of The Above

21. ____ What command would be used to allow the computer to set the color of the turtle ?

A) Pause
B) Wait
C) Random
D) Choose

22. ____ What command would be used to allow the program to pause for a short period of time ?

A) Pause
B) Wait
C) Random
D) Choose

23. ____ How is the Turtle shape changed to a Heart if the corresponding number is 14 ?

A) Setsh 14
B) Setc 14
C) Setbg 14
D) None Of The Above

24. ____ How is the Heart shape changed back to a Turtle shape ?

A) Setsh 0
B) Setc 10
C) Setsh 23
D) Setc 18

25. ____ What command is used to leave the image of the shape on the page ?

A) Fill
B) Stamp
C) Shade
D) Label

26. ____ What command is used to color a design with a certain color ?

A) Fill
B) Stamp
C) Shade
D) Label

27. ____ What command is used to fill a design with a pattern of a shape ?

A) Fill
B) Stamp
C) Shade
D) Label

28. ____ In order to write procedures on the flip side, what command is used ?

A) CTL F
B) CTL D
C) CTL U
D) ESC

29. ____ What command is used to print the picture or drawing in Logo?

A) Print
B) Printtext
C) Printpage
D) Printscreen

30. ____ What command is used to print the flip side after Control D is used ?

A) Print
B) Printtext
C) Printpage
D) Printscreen

31. ____ What command is used to produce musical notes ?

A) Tone
B) Song
C) Shapes
D) Music

32. ____ Using an IBM Computer, what would be the number used for a musical note to sound for a duration of one second:
Tone 440 XX

A) 10
B) 20
C) 16
D) 32

33. ____ Using an IBM Computer, what would be the number used for a musical note to sound for a duration of five seconds:
Tone 262 XXX

A) 40
B) 200
C) 100
D) 320

34. ____ What command is used to leave or logout of Logo ?

A) END
B) CTL F
C) ESC
D) DOS

35. ____ What command is used to see the Shapes page when working on the flip side of a Logo program ?

A) Fill
B) Shapes
C) Shade
D) Namepage

36. ____ After seeing all the shapes on the Shapes Page, what command is used to flip to the shape grid ?

A) CTL F
B) CTL D
C) Space Bar
D) ESC

37. ____ Which Key is depressed to change a white block on the shape grid to black ?

A) CTL F
B) CTL D
C) Space Bar
D) ESC

38. ____ Which Key is depressed to change a black block on the shape grid to white ?

A) CTL F
B) CTL D
C) Space Bar
D) ESC

39. ____ Which Key is depressed to save the corrections in a shape grid ?

A) CTL F
B) CTL D
C) Space Bar
D) ESC

PART 3 -- True/False

DIRECTIONS: Place a T (TRUE) or F (FALSE) in the space provided to determine the value of the statement. (2 points each)

40. ____ Repeat is used to SAVE a Logo program.

41. ____ Any Label that is placed on the screen will be erased when CG is used.

42. ____ When the PU command is used the Turtle will draw a line.

43. ____ When the ST command is used the Turtle will Stamp.

44. ____ When the HT command is used the Turtle will Hide from view.

45. ____ Tone is the command used to play Musical Notes.

46. ____ Fill is the command that is used to fill an object with Color.

47. ____ Stop is the command that can halt a program when it is used in a Procedure.

48. ____ BG is the command used to change the Color of the Turtle.

49. ____ When the PD command is used the Turtle will not draw a line.

50. ____ CG will remove the words off the screen but not the graphics.